

Incorporating science into management

- How to make them act together?

Teams 2024-11-12

Incorporating science into management

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Strategi för svensk viltförvaltning 2022-2029



Reasons for doing this!

- A long tradition of wildlife research (< 50 year).
- Swedish Environmental protection Agency (SEPA) has developed a [national strategy](#) containing five overarching goals.
- One goal is that management should build upon best available knowledge.
- This goal has also been stated in the politics regarding wildlife management.
- Give SEPA mandate and a task to finance research and develop scientifically based tools which can be used in the management.

There are several "suppliers" of knowledge on wildlife

- Swedish University of agricultural Sciences has a special responsibility for science on nature resources and to support the society with there knowledge.
- Several Other universities are also doing research with relevance for wildlife management. Göteborg, Linköping, Lund, Stockholm, Umeå, Luleå and Uppsala Universities all have researcher working on questions regarding wildlife management in one or another way.
- Cooperation between authorities in Sweden, Norway and Finland has broaden the "suppliers" by more universities and research institutes (Nina and Luke).





How do SEPA fund research to support wildlife management?

- There are basically two different ways.
 - i. Yearly open calls for wildlife research through the [Wildlife Management Fund](#).
 - ii. Special assignments from SEPA to appointed university to answer specific questions
- Sometimes there are special calls on wildlife related research through our Environmental research grant ([Miljöforskningsrådet](#)).

Wildlife Management Fund

- Hunters in Sweden pay a yearly fee (400 SEK) in order to hunt. Collected in a fund. Government decides how it should be used.
- Part of this fee is used to fund research on wildlife and management. 21 MSEK for 2024.
- Different research areas are prioritized during six year periods according to SEPAs [research strategy](#).
- A board suggests which projects should be financed based on external reviews. The board consists of scientists, managers and representatives from hunters association.



Wildlife Management Fund

- Scientific quality and relevance to management are given the same weight.
- Compared to other research financer, SEPA demands a substantially higher level of communication with stakeholders.



Special assignments

- SEPA has governmental fundings to execute their tasks and responsibilities
- Part of this fundings is used to perform specific tasks with a scientific approach. (could be viewed as applied science)
- Important since some tasks has to relay on a scientific basis but a scientist have no reward to do it from a scientific perspective (at least not for the fifth time...)





Management can attract scientists!

- Most monitoring systems are developed with a high scientific quality.
- SEPA have established long term carnivore project to give some financial stability for the researchers.
- Authorities could make management decisions which open up for practical experiments.
- Attract scientists' attention and give them possibilities to apply for grants to do scientific analyses on the gathered data or “management experiments”.

Wildlife Management Fund

- There was an identified need for more understanding on multi species management and social aspects of wildlife management.
- The needs were incorporated in the research strategy.
- There was certain needs for investigating the ungulate management.
- Resulted in funding of two major, six year, projects which produced many valuable scientific papers but also a popular scientific reports published by SEPA.
- Results aims to be used in practical management. To start with they were discussed at the yearly National Wildlife Conference arranged by SEPA

NATURVÅRDSVERKET |
FORSKNING | OM VILT

Adaptiv sam- och flerartsförvaltning av klövvilt

Gemensam rapport för forsknings-
projekten Beyond Moose
och Governance

Joris Cromsigt, Sabrina Dressel,
Göran Ericsson, Annika Felton,
Maria Johansson, Wiebke Neumann,
Sabine Pfeffer, Camilla Sandström,
Navinder Singh, Annelie Sjölander-
Lindqvist, Robert Spitzer,
Fredrik Widemo, Anna Widén

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Special assignments

- Sweden manages the large carnivores by license hunting.
- Need harvest models to predict the effect of hunting securing we do not go below reference value reported to EU.

Bekäntning (omn. vargar)	Populationsstreck			Sannolikhet < 300 vargar/år	
	Median	80 % KI	95 % KI		
1 oktober 2021	424 *	342 – 521	326 – 544	293 – 596	0,007
1 oktober 2021 – 30 september 2022	444	326 – 613	301 – 669	245 – 842	0,024
1 oktober 2022 – 30 september 2023	507	377 – 684	317 – 770	298 – 871	0,026
0	501	372 – 678	332 – 762	294 – 860	0,028
10	495	367 – 671	327 – 737	289 – 856	0,031
15	490	361 – 665	322 – 749	284 – 850	0,034
20	484	356 – 659	316 – 743	278 – 843	0,037
25	478	350 – 653	311 – 737	273 – 838	0,041
30	473	345 – 647	306 – 731	268 – 830	0,045
35	467	340 – 640	301 – 723	264 – 822	0,049
40	461	339 – 640	300 – 722	263 – 821	0,050
45	456	334 – 634	296 – 717	258 – 817	0,054
50	450	329 – 628	290 – 711	253 – 807	0,060
55	444	323 – 623	285 – 703	248 – 803	0,066
60	438	318 – 616	280 – 698	243 – 798	0,073
65	433	313 – 610	274 – 691	238 – 797	0,080
70	427	307 – 604	269 – 685	233 – 781	0,088
75	421	302 – 596	264 – 677	228 – 774	0,097
80	416	296 – 589	259 – 673	223 – 767	0,107
85	410	291 – 583	254 – 666	218 – 758	0,117
90	404	286 – 576	249 – 659	213 – 752	0,128
95	398	280 – 573	243 – 652	207 – 747	0,141
100	392	275 – 567	238 – 647	203 – 739	0,154
		269 – 561	233 – 639	198 – 731	0,168

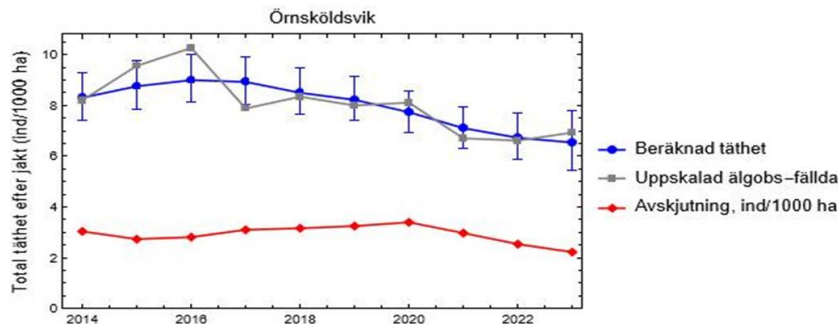


- Yearly assignment to SLU and Nina (Norway) to provide the regional large carnivore managers with Scientifically based harvest models.



Special assignments

- Based on moose ecology, data on harvest and traffic accidents together with the hunters reported observations on Moose during hunt, SLU got an assignment to develop a tool to estimate the moose density in moose management areas.



- Now we can follow the moose population. Have led to discussions of the use.

Management can attract scientists!

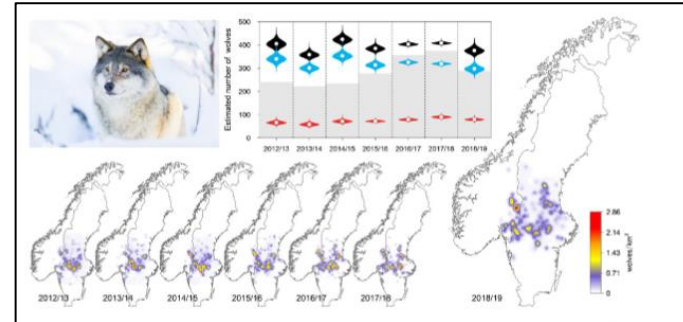
- Monitoring of large carnivores includes DNA-collection with high quality.
- Scientists from Norwegian University of Life Sciences (NMBU) identified these data and suggested a project on spatial mark and recapture estimates on bear, wolf, wolverine.
- Co-financed by SEPA and Norwegian Environment Agency.
- Excellent science (published in PNAS) and very useful data in management.
- Now a yearly task for NMBU -> assignment.

Estimating and forecasting spatial population dynamics of apex predators using transnational genetic monitoring

Richard Bischof^{A1}, Cyril Milleret^{A2}, Pierre Dupont^{A3}, Joseph Chipperfield^{A4}, Mahdieh Tourani^{A5}, Andrés Ordiz^{A6}, Perry de Valpine^{A7}, Daniel Turek^{A8}, J. Andrew Royle^{A9}, Olivier Gimenez^{A10}, Øystein Flagstad^{A11}, Mikael Åkesson^{A12}, Linn Svensson^{A13}, Henrik Broseth^{A14}, and Jonas Kindberg^{A15}

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Conclusions!

- Scientifically based management has served us well in the large carnivore management.
- We are implementing scientifically developed tools in the ungulate management and encounter some resistance.
- Scientifically based management do not lead to acceptance by itself but what is the alternative in a world of “Alternative facts”
- Science doesn't solve conflicts based on different opinions about the management goals. However, it helps by suggesting effective solutions and how to monitor and evaluate the results in an objective way.



Conclusions!

- Need to have special resources to finance. If not, hard to compete with other scientific areas and at the same time developing relevant knowledge for managers.
- Need to set up common arenas for scientists and managers.
- Need to do a lot of communication for those who are sceptical but want to understand.
- Need to continuously evaluate the system and be prepared to changes methods if necessary although that can be difficult when introducing a new method.



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