SUSTAIN

SUSTAIN – Third Annual Meeting

Clarion Hotel The Edge, Tromsø
29th – 31st January 2018

We are delighted to invite you to the 3rd annual meeting of SUSTAIN. This meeting is assembled in two lunch-to-lunch communication sessions: a first session devoted to "Science-to-Science" (lunch-to-lunch 29th – 30th January) and a second devoted to a "Science-to-Policy" (lunch-to-lunch 30th – 31st January). Everybody is welcome to all sessions. The details of these sessions are provided below for those of you that wish to only join specific sessions.

The **Science-to-Science** session is devoted for purely research communication, with presentations of results or plans for coming up research, as well as discussions. This section is structured around the three specific questions SUSTAIN and the Work Packages aim to answer.

The **Science-to-Policy** session is intended as a user panel meeting/workshop with specific objectives structured around the different case studies within SUSTAIN. The details of these objectives are listed below.

SUSTAIN 3rd Annual Meeting Schedule Overview

Monday 29th January

12:00-12:45 Arrival and lunch

12:45-13:00 Welcome (Nils Stenseth, Rolf Ims, Bernt-Erik Sæther)

Opening of the **Science-to-Science** session

13:00-15:00 Theme 1 – chaired by Øystein Langangen
Effects of environmental change, harvesting, and their interactions on **"Dynamics of structured populations"**

15:00-15:20 Coffee/tea/snacks break

15:20-15:45 Georgina Mace (15+10 min)
"Towards a resilient ecological network: a case study from national plans in England"

15:45-16:30 John Fryxell (30+15 min)
"How supply and demand drive critical transition to dysfunctional fisheries"

16:30-16:45 Coffee/tea/snacks break

16:45-18:45 Theme 2 – chaired by John-André Henden/Aline Lee
Effects of environmental change, harvesting, and their interactions on **"Species interactions within and between trophic levels"**

19:30 Diner at Arctandria – Drink in the lobby from 19h

Tuesday 30th January

08:00-10:00 Theme 3 – chaired by Joël Durant/Ivar Herfindal
Effects of environmental change, harvesting, and their interactions on **"Spatial patterns and dynamics of species and their environment"**

10:00-10:20 Coffee/tea/snacks break

10:20-10:50 Christian Damgaard (20+10 min)
"Spatio-temporal structural equation modeling in a hierarchical Bayesian framework: wet heathlands"

10:50-11:45 SUSTAIN book (Nils Stenseth)

11:45-12:30 Lunch

12:30-14:00 General discussion – chaired by Nigel Yoccoz
What have we not answered yet, and what has been done to answer the general aim of SUSTAIN

14:00-14:15 Conclusion of the **Science-to-Science** session (Nils Stenseth)

14:15-14:30 Coffee/tea/snacks break

14:30-14:40 Opening of the **Science-to-Policy** session (Sandra Hamel)

14:40-15:40 John Linnell (45+15 min)
"Teeth, claws, laws, hearts and minds: what is shaping the future for large mammals and their ecosystems in Europe?"

15:40-16:30 Presentation of the strategic foresight achieved/planed for the three cases not discussed in a detailed workshop
- Svalbard reindeer (Torkild Tverra, 10 min)
- Mjøsa (Øystein Langangen, 10 min)
- Moose and boreal forest (Ivar Herfindal, 30 min)

16:30-16:45 Coffee/tea/snacks break

16:45-18:45 Workshop 1 – Ptarmigan case (chair: John André Henden)

19:00 Diner at Fiskekompaniet

Wednesday 31th January

08:00-10:00 Workshop 2 – Barents Sea case (chair: Joël Durant)

10:00-10:15 Coffee/tea/snacks break

10:15-12:15 Workshop 3 – Svalbard case (chair: Eva Fuglei)

12:15-13:00 Lunch

13:00-14:45 Workshop 4 – Invasive species case (chair: Rolf Ims)

14:45-15:00 Conclusion of the **Science-to-Policy** session (Rolf Ims)

SUSTAIN DETAILED SCHEDULE

The "Science-to-Science" session will include presentations and discussions grouped under three specific themes. Two hours will be devoted to each theme, with presentations of some results/planned analyses followed by a structured discussion on how to move forward on this theme.

Theme 1 – chaired by Øystein Langangen

Effects of environmental change, harvesting, and their interactions on
Dynamics of structured populations

13:00–13:05 Introduction – Øystein Langangen

13:05–13:15 Marlene Wæge Stubberud
Effects of size-specific harvesting on population structure and growth: a two-sex integral projection model approach

13:15–13:25 Chloé Nater
Individual heterogeneity and early life conditions shape growth in a freshwater top-predator

13:25–13:35 Øystein Langangen
Exploring the benefit of long distance migration using a length structured population model

13:35–13:45 Edwige Bellier
Stage-dependent interactions of two harvested competitors

13:45–13:55 Joël Durant
Harvesting, climate and population structure of harvested stocks in the Barents Sea

13:55–14:05 Brage B. Hansen
How will different harvest regimes modify climate change effects on Svalbard reindeer population dynamics?

14:05–14:15 Edwige Bellier
Effect of body weight on demography of a harvested population

14:15–15:00 Summary and discussion

**Note that some titles may change slightly.*

Theme 2 – chaired by John André Henden/Aline Lee

Effects of environmental change, harvesting, and their interactions on

Species interactions within and between trophic levels

16:45–16:50 Introduction – John-André Henden/Aline Lee

16:50–17:05 Filippo Marolla

Opposite predation-mediated effects of food web dynamics on an endangered arctic-nesting goose: implications for management

17:20–17:35 John-André Henden

Effect of climate, harvest and community interactions on willow ptarmigan population dynamics

17:35–17:50 Edwige Bellier

Harvest of interacting species affected by climate

17:50–18:05 Jarad Pope Mellard

Effect of scavenging on predation in food webs

18:05–18:20 Aline Magdalena Lee

Effect of environmental stochasticity on the covariance of two competing species

18:20–18:30 John-André Henden/Aline Lee

Summary and other relevant ongoing work

18:30–18:45 Discussion

**Note that some titles may change slightly.*

Theme 3 – chaired by Joël Durant/Ivar Herfindal

Effects of environmental change, harvesting, and their interactions on

Spatial patterns and dynamics of species and their environment

8:00–8:10 Introduction – Joël Durant/Ivar Herfindal

8:10–8:40 Ivar Herfindal
How does climate affect the spatial scaling properties in terrestrial species?

8:40–8:55 Brage B. Hansen
Spatial population synchrony on the arctic tundra: the role of climate and trophic interactions

8:55–9:10 Filippo Marolla
Fitness-consequences of timing and migration of the Lesser White-fronted Goose

9:10–9:25 Jonathan Fredricson
Life history traits and spatial scaling of population dynamics of marine fish in the Barents sea

9:25–9:40 Joël Durant
Cod migration and recruitment. Where and how to harvest?

9:40–10:00 Discussion

**Note that some titles may change slightly.*

The "Science-to-Science" session will end on a discussion relating to the whole SUSTAIN project.

The aim of SUSTAIN is to assess the influence of the interactions between climate and harvest on freshwater, marine and terrestrial ecosystems, the impact of these drivers on the management of these ecosystems, and the integration of science and management through the use of a strategic foresight protocol.

The first part of the discussion will be devoted to pinpointing areas that have not been answered by SUSTAIN yet, whereas the second part will focus on discussing what has been achieved and how can we strengthen it to answer even better the aim of SUSTAIN.

The "Science-to-Policy" session includes four workshops specific to four case studies in SUSTAIN. The work done in the three other case studies will be presented shortly but will not be discussed in details (see the explanation for each case at the end of the document).

Each case will be discussed in a round table, in the format of a workshop/open discussion with specific objectives for each case. The round tables for each case will last 2h and will run sequentially so everyone can join. The room will be organized to have a round table but also extra chairs outside the round table for those interested but less involved in some specific case studies.

Workshop 1 - Rock and willow ptarmigan

Leader:
John-André Henden (UiT)

Objective:
The main goal is to get the perspective of end-users on the results obtained based on the last round table in early November. This will be done in two steps:

1. The round table will start with a short presentation of the timeline of this case study, presenting which objectives were defined by scientifics and end-users, what has been done and what is still planned to be done.

2. Then, an open discussion will follow based on a document that will be sent in early January to end-users. The document will summarise results and the researchers would like if end-users could bring their own interpretation of these results to the discussion on whether these results are valuable for managing ptarmigans and useful in the decision-making process. They would also like to get feedback on whether some aspects could be improved and if they feel some essential objectives have been left aside and should be reconsidered.

Expectations:
Researchers - Prepare some discussion points and results to discuss with the end-users related to the document summarizing the ptarmigan work that will be sent in early January to end-users.

End-users - Read the document that will be sent in early January, which will include some questions/results for you to start reflecting on. Share your perspective on these aspects at the meeting.

Workshop 2 - Barents Sea

Leader:
Joel Durant (UiO)

Objective:
Present results to end-users and how these results could be useful for management. The aim is to get feedback from end-users on specific things done and what can be improved or done for this case.

Expectations:
Researchers - Prepare some discussion points and results to discuss with the end-users.

End-users - Not expected to prepare something specific unless they wish to bring their own inputs.

Workshop 3 - Svalbard terrestrial

Leaders:
Eva Fuglei/Åshild Pederson (NP)

Objective:
The main objective is to present results on the three harvested species in Svalbard to the end-users and discuss if they meet the goals of the case. It is important for researchers to get the end-users perspective on the new results, obtained after our meeting in Longyearbyen early November 2017. During the November meeting, we agreed to start the following work before the annual meeting in January:

Svalbard reindeer

- Develop a simple tool to estimate the quota (number of animals by sex and age) based on current year's population counts, last year's off take, and the winter conditions the past winter (Bart/Brage/Åshild)

Svalbard rock ptarmigan

- Build a stochastic population model that combines the available data with parameter distributions from the literature and knowledge or best estimates of population processes. In this way, different scenarios that could cause observed patterns in numbers of territorial males and hunting output can be identified and analysed, allowing us to pinpoint what additional data is needed to gain an understanding of the population dynamics and predict future developments (Aline)

- Develop a simple model to calculate current and future possible harvest rates (John André/Filippo/Jarad)

- Develop/adjust a population model for ptarmigan based on the replicates of counts of territorial males in spring where we include habitat and terrain variables as well as predictors related to climatic conditions (John André/Filippo/Jarad)

- Look at interspecific interactions using structural equation modelling to study direct and indirect relationships between ptarmigans and pink-footed geese, arctic fox, reindeer carcasses, and climate. We aim to test hypotheses on the direction and strength of such relationships (Filippo)

Arctic fox

- Develop a demographic model to estimate survival across age and sex in the population, reproductive rates, and population age and sex structure. Such estimates will advance our ability to evaluate the interacting effects of harvesting and climate on arctic fox populations and the current management practice (Chloé)

We plan to do the discussion in two steps:

1. The round table discussion will start with a short update of the timeline of the case study, presenting which objectives were initially defined by the end-users and scientists, what has been done and what is still needed to be done. This will be followed by a short presentation from Bart, Brage, Aline, John André, Filippo, Jarad and Chloé on the progress of the tools and models that we agreed to work on.

2. Then, we will follow with a discussion based on a document that summarizes the results. We will send this document to the end-users in early January. The researchers would like if end-users could bring their own interpretation of these results to the discussion on whether these results are valuable for the management of the species. We would also like to get feedback on whether some aspects could be improved and if essential objectives have been left aside and should be reconsidered.

Expectations:

Researchers - Submit a summary of your main results to Eva/Åshild so that we can prepare a document summarizing the results. Prepare some discussion points and results to discuss with the end-users related to the document summarizing the work on the different models, which will be sent in early January to end-users.

End-users - Read the document that will be send in early January, which will include some questions/results for you to reflect upon. Share your perspective on these aspects at the meeting.

Workshop 4 - Climate related invasive species

Leader:
Rolf Ims (UiT)

Objective:
The main goal is to get the perspective of end-users on the results obtained after refining the model following a meeting in October as well as results not presented yet regarding the red fox. This will be done in two steps:

1. The round table will start with a short presentation of the timeline of this case study, presenting which objectives were defined by scientifics and end-users, what has been done and what is still planned to be done.

2. Then, an open discussion will follow based on a document that will be sent in early January to end-users. The document will summarise results and the researchers would like if end-users could bring their own interpretation of these results to the discussion on whether these results are valuable for managing these species and useful in the decision-making process. They would also like to get feedback on whether some aspects could be improved and if they feel some essential objectives have been left aside and should be reconsidered.

Expectations:
Researchers - Prepare some discussion points and results to discuss with the end-users related to the document summarizing the red fox and lesser-white fronted geese work that will be sent in early January to end-users.

End-users - Read the document that will be sent in early January, which will include some questions/results for you to start reflecting on. Share your perspective on these aspects at the meeting.

CASE STUDIES THAT WILL NOT HAVE ROUND TABLES

Semi-domesticated reindeer

Leaders:
Torkild Tveraa/Audun Stien (NINA Tromsø)

Explanation: SUSTAIN is working on a model that we want to present to the end-users for inputs, but this model is not ready yet. The aim is to have a round table later in the spring 2018. End-users concerned with this case have been contacted and informed about this plan.

Mjøsa – Gudbrandsdalslågen system

Leader:
Asbjørn Vøllestad (UiO)

Explanation: This case study has held a large end-user meeting earlier locally (Hamar), as well as have had several more informal interactions. Because it is easier to meet with end-users locally (Hamar or Lillehammer), this case will have a meeting/workshop in the spring instead of during the SUSTAIN Annual Meeting. End-users concerned with this case have been contacted and informed about this plan.

Moose and boreal forest

Leaders:
Ivar Herfindal (NTNU)/Erling Solberg (NINA Trondheim)

Explanation: This case will only be shortly presented and discussed (30 min) because most research in this case will take place in the coming year. The discussion will include a short update of the timeline of this case study, presenting which objectives were defined by the end-users and scientists. It will present results up to now and the plans of what is about to be done in the coming year. Specific end-user meetings will be held once more results have been achieved, in the spring/summer. End-users concerned with this case have been contacted and informed about this plan.

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