

Introduction to decision making for applied ecology and conservation

Dates and location: 30.1.2023 – 2.2.2023, University of Bern

Registration: <https://www.cuso.ch/onepage/?p=5749&uid=6666>

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Background

Scientists and managers working to preserve biodiversity constantly need to make and advise management decisions, often with conflicting objectives, time pressure, limited resources and incomplete knowledge. Recognizing this complexity, conservation increasingly uses a range of principles and tools to make rational decisions in difficult situations.

This four-day course provides a primer in decision analysis for conservation. It is aimed at students of ecology and evolution who seek a career in making or advising conservation decisions, independently or interacting with management agencies and practitioners. Each day combines lectures, practical training, and small group activities to enable application to real-world conservation challenges. All speakers are leading conservation experts with years of experience in delivering training to future and current scientists and practitioners.

Course structure

- Day 1: conservation decision-making (9:00 – 17:00)
 - Introductions and course structure
 - Making conservation decisions (Dr. John Ewen, Zoological Society London, UK)
 - Breakout: identifying the components of a conservation decision problem
 - *Lunch break*
 - Predictions for decision-making (Dr. Stefano Canessa, University of Bern)
 - Practical: structured expert elicitation
- Day 2: science and values (9:00 – 17:00)
 - Morning: setting objectives and choosing metrics (Dr. John Ewen)
 - Breakout: building an objective hierarchy
 - Practical: multi-criteria decision analysis
 - *Lunch break*
 - Afternoon: uncertainty and risk attitudes (Dr. Stefano Canessa)
 - Practical: decision trees
- Day 3: systematic conservation planning (9:00 – 17:00)
 - Species distribution models for conservation decisions (Prof. A. Guisan, University of Lausanne, CH)
 - Systematic conservation planning (Dr. Virgilio Hermoso, University of Sevilla, Spain)
 - *Lunch break*
 - Practical: using MARXAN to design protected areas (Dr. Alejandra Morán, CREA, Spain)
- Day 4: uncertainty and learning (9:00 – 16:00)
 - Uncertainty and learning (Dr. Stefano Canessa)
 - Monitoring for conservation (Dr. Benedikt Schmidt, University of Zurich)
 - *Lunch break*
 - Practical: value of information
 - Breakout: adaptive management
 - Conclusions and feedback

Additional information on the course

Different versions of this course have been delivered in the past decade by the organizer and speakers. Courses usually involve a mix of students, researchers and managers (current or in training). Much of the course content is tailored to the audience and interest of specific courses. The majority of these courses have been carried out in collaboration with the International Union for the Conservation of Nature / Species Survival Commission (see for example <https://iucn-ctsg.org/training>).

Recent editions have reached an overall audience of >300 participants from 33 countries and have been delivered in:

- 2016 Wellington, New Zealand (2-day course)
- 2016 Honolulu, Hawaii, USA (4-day course)
- 2017 London, United Kingdom (4-day course)
- 2018 Chicago, USA (5-day course)
- 2019 Punta Islita, Costa Rica (5-day course)
- 2022 London, United Kingdom (2-day course)
- 2022 Prague, Czech Republic (2-day course)

The overall framework and structure is based on the Training in Structured Decision Making developed by the United States Geological Survey (<https://www.usgs.gov/centers/eesc/science/structured-decision-making-methods-applications-and-capacity-building>). The systematic conservation planning component (day 3) will be based on several training courses delivered by speakers (Dr. Virgilio Hermoso and Dr. Alejandra Moran Ordonez; see for example <https://cibio.up.pt/en/events/advanced-course-spatial-conservation-prioritization-concepts-methods-and-applications-2/>).

Speakers' bios

Stefano Canessa is a Senior Postdoc in the Division of Conservation Biology at the University of Bern, and an Honorary Fellow at the Zoological Society of London. His research focuses on demographic modelling, risk analysis and decision-making for endangered species recovery. He has been involved in more than 30 species recovery plans across the globe, ranging from frogs and turtles to birds and bats.

John Ewen is a Senior Research Fellow at the Institute of Zoology, Zoological Society of London. His research focuses on reintroduction biology and threatened species recovery. He is co-chair of New Zealand's Hibi (Stitchbird) Recovery Group and of the Sihek (Guam kingfisher) Recovery group, and is involved in many projects including birds and mammals spanning New Zealand, Australia and Mauritius.

Antoine Guisan is Professor of Spatial Ecology at the University of Lausanne. His main focus is on spatial predictive modelling of plant and animal distributions and communities. Besides theoretical and methodological interests in understanding and predicting species distributions, his group develops models for various decision-making purposes, such as rare species management, assessing the potential impact of climate change on biodiversity, and anticipating biological invasions.

Virgilio Hermoso is a Senior Research Fellow at the Universidad de Sevilla, Spain. He works on decision theory applied to conservation and rehabilitation planning in freshwater ecosystems at different spatial scales from single catchments to broad conservation assessment, also using and accommodating Marxan to the needs and particularities of freshwater ecosystems.

Alejandra Morán Ordóñez is a postdoctoral fellow at the Centro de Investigación Ecológica y Aplicaciones Forestales, Universidad Autónoma de Barcelona (Spain). She is a landscape ecologist and ecological modeler interested in how nature and society interact, and how both can be influenced by environmental policy and ecosystems management. She uses quantitative tools to understand ecological patterns and processes across multiple spatio-temporal scales; then, she applies that ecological information to assist real conservation planning.

Benedikt Schmidt is a Group Leader at the University of Zürich. His research focuses on ecology and conservation of amphibians and reptiles, with an emphasis on knowledge transfer for decision making, particularly on monitoring of populations and statistics in ecology. He emphasizes applied research as well as the dissemination of knowledge relating to the improvement of the protection of nature and species.

Selected feedback from past courses

The workshops were the most useful 4 days I've spent in a long time! The course was really helpful and it was great to learn some new tools for structured decision making and to get such a wide range of perspectives on some of the aspects of translocation planning that are common to many projects. It was also nice to meet such a bunch of great people. **J, Wales**

It was really enjoyable and I think a lot of it will prove to be very useful. **C, England**

Thank you so much for an amazing organization and facilitation job! It was a great privilege to be part of this group and course! **C, the Netherlands**

It was the first training I've done for years and was good to leave feeling like I'd been challenged and learnt a lot, with lots of stuff to take away and try out. Thanks for the course materials, too. **K, England**

It was very enjoyable and I anticipate that the tools will prove very useful. **T, England**

I really enjoyed the course and sat through most of it thinking my job would be so much easier if people applied the methods discussed at least to some extent. **K, England**

I found the workshop very interesting and hope to share it with colleagues. **S, Australia**

Thank you so much for having me! The course was really interesting and I hope that I can implement some of it in our work here at Nordens Ark. **E, Sweden**

Thank you for facilitating my participation. The workshop was enjoyable and informative, I look forward to applying the lessons in our projects. **K, Zambia**

Thank you very much for your great efforts and success of the training. I find it very useful and I enjoyed it a lot. Thank you very much. **P, Czech Republic**

The course was great! I've been thinking about it a lot, considering how it could be applied. **C, England**

Thanks again for running the course – I found it really useful and have already been thinking about how I can apply some of those tools to our project. **H, United States**

Fantastic thanks. It was great to meet you and the team and I got lots out of the course. **H, Scotland**

Thank you so much for the opportunity to participate in the training workshop, it was really interesting. As with workshops and conferences, the networking was of course a great added bonus from which I picked up some very promising new ideas. **P, Guatemala**

I really enjoyed the course and meeting all the lecturers and participants. I've found that the course has influenced the way I think about my project and will certainly influence planning in the future. **C, South Africa**

Thank you for this and thanks again for organising the workshop, it was all simply fantastic. **S, Australia**

I did really enjoy the workshop and conference, it was a wonderful way to learn about the process and some of the major ideas in reintroductions. Working in the siskin group was my favorite part and provided an example of how everything we learned works together. **H, United States**

It was a fantastic course which I'm busily trying to put it into practice. **D, Australia**

I am so grateful to have had the opportunity to participate in that training. It was one of the best investments of time in that kind of thing I've made in memory. It was really, really good. **S, United States**

Thanks for the wonderful workshop, I really enjoyed my time there and learned a lot. **H, United States**

Thanks for sending this along. I very much enjoyed the workshop and we are working on applying what we learned already! **L, Canada**

I absolutely loved the workshop and conference in Chicago. I found the workshop particularly beneficial and I have already been discussing ways of implementing new things over here on the Island. **JP, Australia**