Predictive modelling of ES after peat land re-use, trade-off calculation and decision support tool development

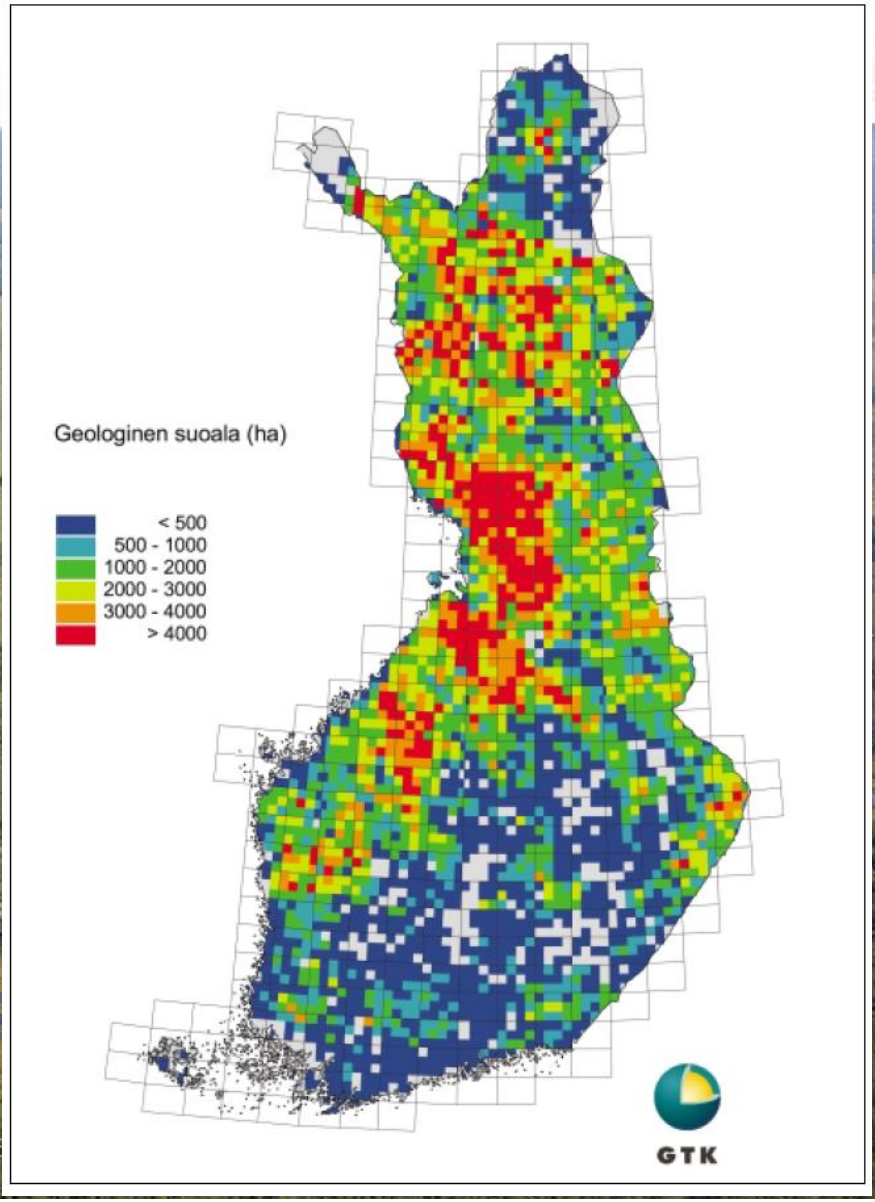
Quantification and valuation of ecosystem services to optimize sustainable re-use for low-productive drained peatlands LIFEPeatLandUse, LIFE12/ENV/FI/150

Miia Parviainen, Natural Resources Institute Finland (Luke)

LIFE Platform meeting on Ecosystem Services 10-12 May 2017

Backround: Finland, region of peatlands

- Originally 10 million ha of peatlands in Finland.
- Finland is a country with the highest percentage cover of peatlands (30% of total land area) in the world, and the highest absolute cover of peatlands in EU.



Backround: Finland, region of peatlands

More than half of the original mires have been drained to increase tree growth.

Backround: Finland, region of peatlands

Low-productive drained peatlands, where timber production is not commercially productive without specific maintenance options, cover **20% (ca. 0.8. million ha)** of the drained peatland area in Finland, mostly situated in Northern Finland.

Poor

Jätkg: Lichen

Peatland drainage has deteriorated the biodiversity and increased the environmental loading and GHG emissions!

Ptkg: *Vaccinium Vitis-idaea* type

Rhtg: Herb-rich type

Fertile

Photos: Hannu Nousiainen

Luke
NATURAL RESOURCES INSTITUTE FINLAND

Key-question concerning peatland use in Finland:

what to do to these low-productive drained peatlands?

Key-question in Finland: what to do to these low-productive drained peatlands?

Different potential

Conflicting demands →

Need to evaluate the the effects of different re-use options on ecosystem services!

Long-term environmental data + predictive modeling

→ Offer cost-efficient methods

1. No actions
2. Harvest of wo
3. Enhanced for
4. Restoration

station
ation and
rewetting

Photos: Anne Tolvanen/Erkki Oksanen/Luke

Luke
NATURAL RESOURCES INSTITUTE FINLAND

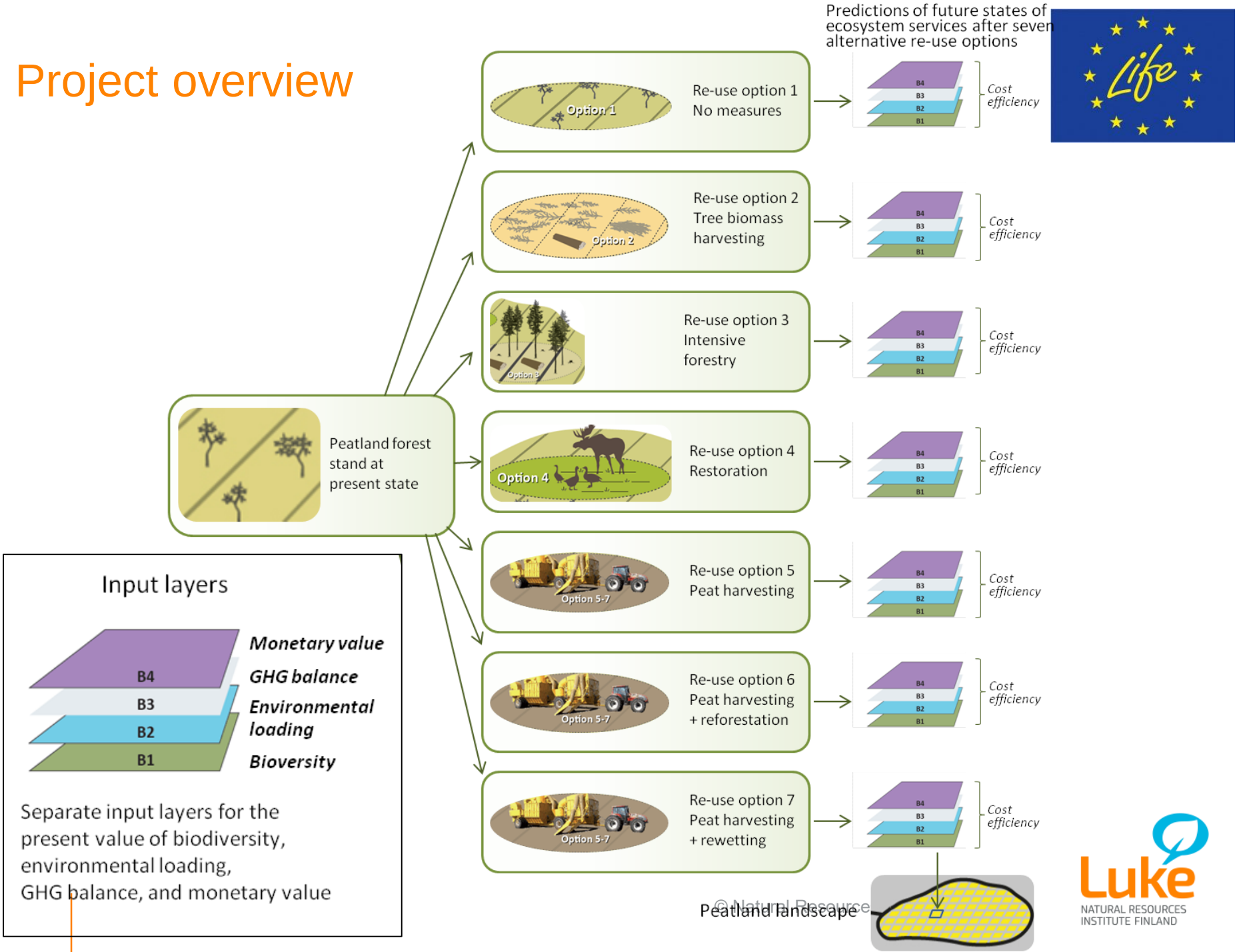
LIFEPeatLandUse

Quantification and valuation of ecosystem services to optimize sustainable re-use for low-productive drained peatlands LIFEPeatLandUse LIFE12/ENV/FI/150 - EU LIFE+ Environment, years 2013-2018 (1.7.2013 – 30.6.2018)

- To develop and demonstrate a decision support system to quantify and value ecosystem services and optimize ecologically, economically and socio-culturally sustainable land use
- To consolidate and increase the knowledge base on the impacts of peatland use on ecosystem services through the compilation of multiple datasets and state of the art modeling.
- To enhance general awareness, reduce conflicts, and promote stakeholder co-operation concerning the use of peatlands
- To promote the sharing and utilization of long-term monitoring data and scientific information in the land use planning and decision making.

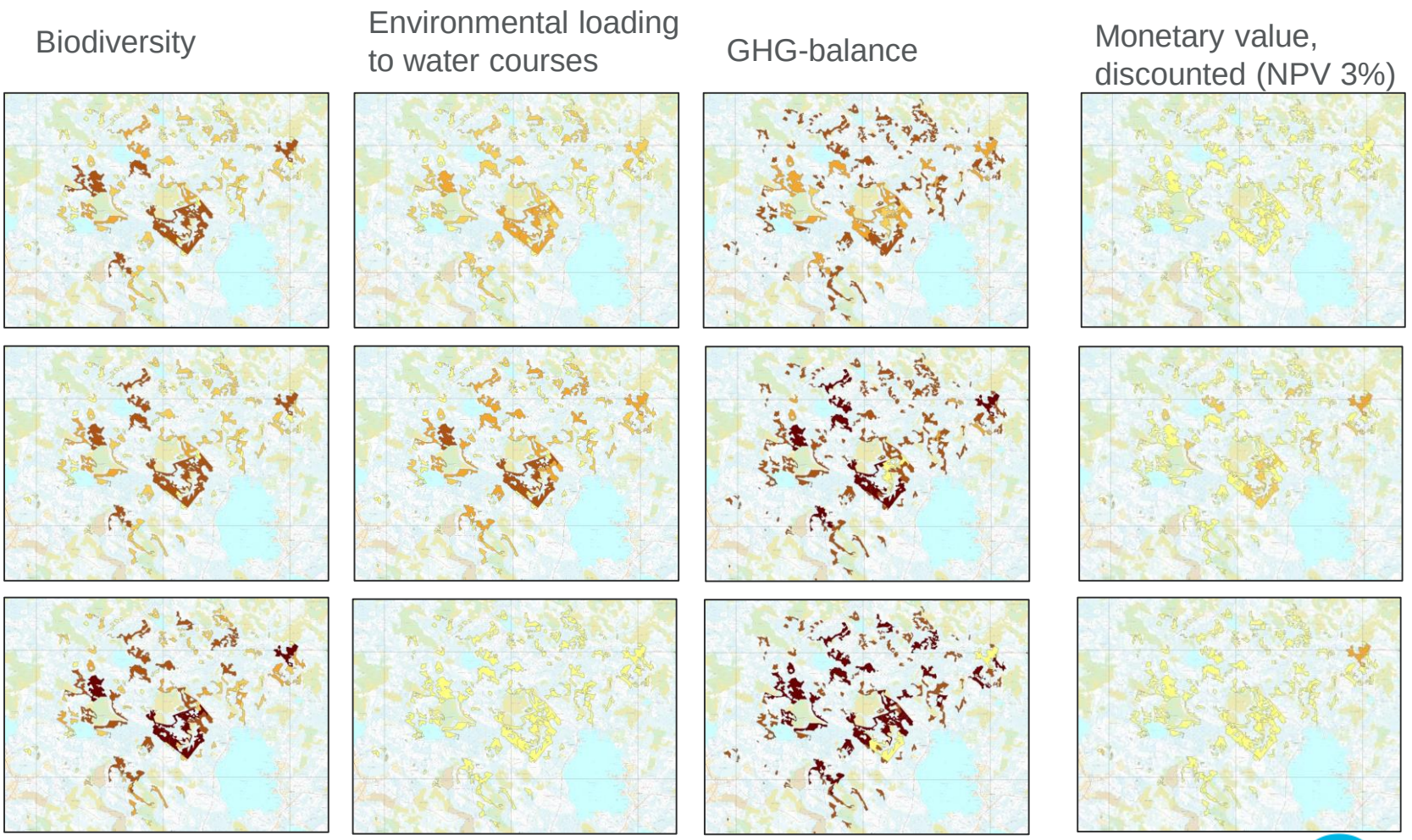
Luke
NATURAL RESOURCES INSTITUTE FINLAND

Project overview



Some examples of the predictions

Predictions of ES after 30 years

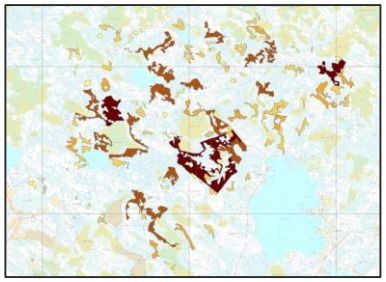


Luke
NATURAL RESOURCES INSTITUTE FINLAND

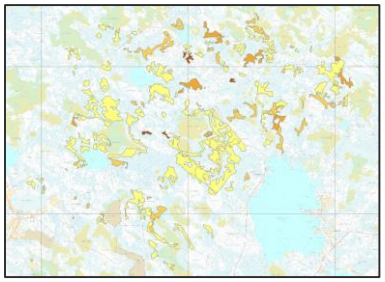
Eventually

Predictions of 7 re-use options, cost-efficiency and optimization in Finland

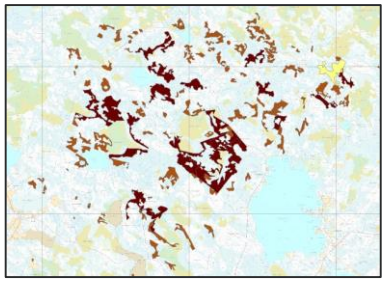
Biodiversity(B1)



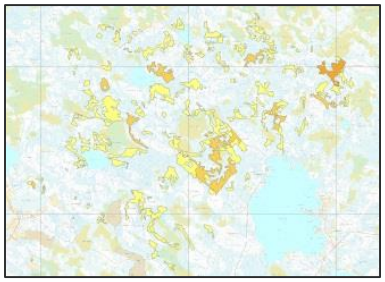
Environmental loading to water courses (B2)

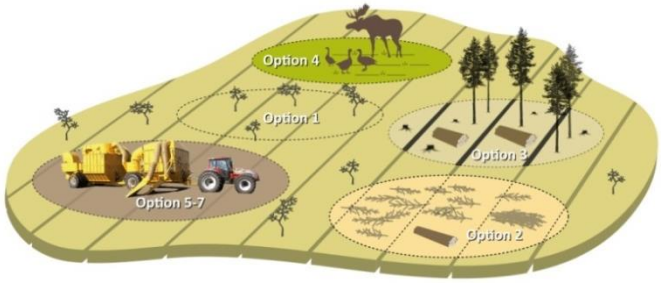


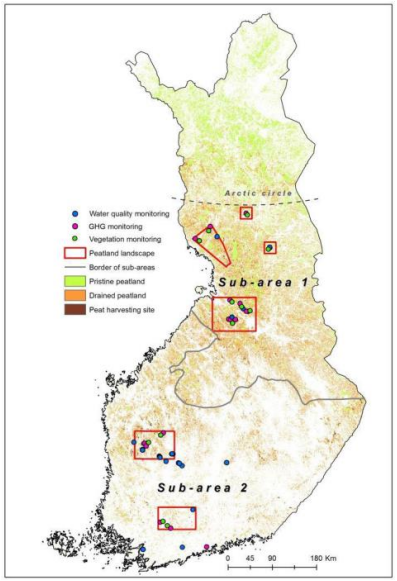
GHG-balance (B3)



Monetary value (NPV 3%) (B4)







- Map of optimal re-uses of low-productive drained peatlands in Finland
- Maximized monetary value by acknowledging environmental constraints

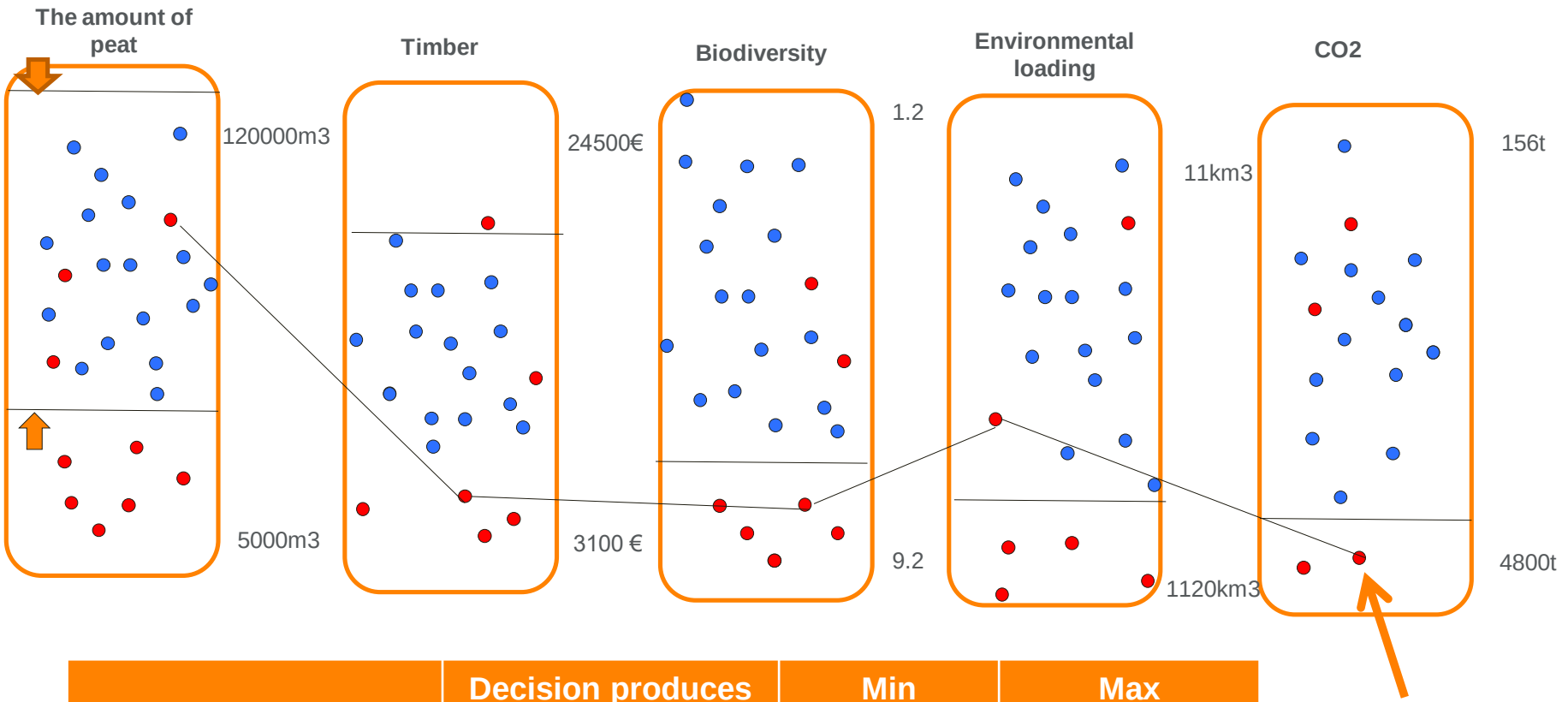
Luke
NATURAL RESOURCES INSTITUTE FINLAND

How have we engaged with the policy makers or decision makers – are there lessons to learn?

- Predictions from Actions B1-B4 are integrated into a web-based participatory decision support tool Yoda (Your decision assistant tool, working title was SUO-Mesta), which is tailored for sustainable peatland use planning

Yoda

- Selected for peat harvesting
- Not selected



	Decision produces	Min	Max
Annual peat production	12 000 000 m3	0	19 000 000
The amount of timber	11 256 m3	0	45 500
Net income/year	12 300 000 €	0	18 300 000
Biodiversity	Index value	min	max

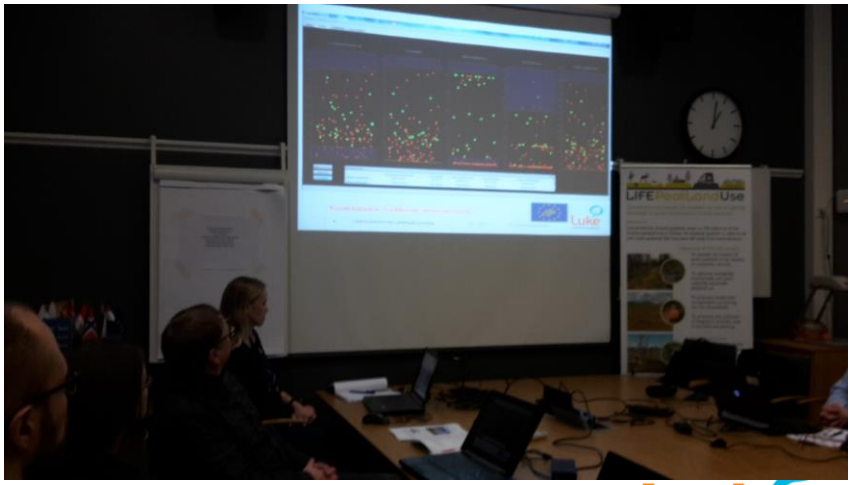
Single peatland

Luke
NATURAL RESOURCES INSTITUTE FINLAND

How have we engaged with the policy makers or decision makers – are there lessons to learn?

- Yoda has been tested and demonstrated it in a real practical planning situation in the Council of Northern Ostrobothnia (selecting peat harvesting areas), **which integrates the project in the actual decision making situation**

→ **The results of the proposed project benefit directly to the Regional Councils in their task to draw up land use plans for low-productive drained peatlands.**



Summary

- The re-use of low-productive drained peatlands is **topical issue** in Finland
  - LIFEPeatLandUse will help land-use planners and decision-makers to make **ecologically, economically and socio-culturally sustainable** land use decisions at national, regional and local level.
- The decision support system (Yoda) provides an innovative, quantitative approach to increase the sustainability and reduce conflicts concerning peatland use, and **it is applicable to any land use planning**, where ecological, economic and socio-cultural values may be in trade-off.

Project group

- Project leader Anne Tolvanen (Luke)
- Project coordinator Miia Parviainen (Luke)

Action leaders

- B1 Biodiversity Anne Tolvanen (Luke)
- B2 Environmental loading to water courses Mika Nieminen (Luke)
- B3 GHG-balances Kari Minkkinen (UnivHelsinki)
- B4 Cost-efficiency Artti Juutinen (Luke)
- B5 Decision analysis Mikko Kurttila (Luke)
- B6 Map demonstration Miia Parviainen (Luke)

More information

- http://www.metla.fi/hanke/8547/

From Jan. 1. 2015, Metla is part of the Natural Resources Institute Finland. www.luke.fi

Luke
LUONNONVARAKESKUS

SUOMEKSI PÅ SVENSKA IN ENGLISH AUF DEUTSCH ПО-РУССКИ

Home | Research | Services | Publications | Metinfo | Research forests | About the institute | Strategy | Contact

Metla » Research » Research projects » 8547

Sitemap | Search

LIFEPeatLandUse: Quantification and valuation of ecosystem services to optimize sustainable re-use for low-productive drained peatlands

Homepage
Objectives
Re-use options
Implementation actions
Publications
Project management
Networking
Finnish

LIFEPeatLandUse

Logo: Metla/Jouni Hyvärinen

What to do with low-productive drained peatlands that have been left aside from active forestry?

More than half of the original mires have been drained to increase tree growth. However, tree growth has remained low in part of these drained wooded peatlands mainly due to nutrient poor ground. These low-productive drained peatlands, where timber production is not commercially productive without specific maintenance options, cover 20% (ca. 0.8. million ha) of the drained peatland area in Finland, mostly situated in Northern Finland. The key questions concerning the use of peatlands in Finland are: what to do with these low-productive drained peatlands that have been left aside from active forestry?

These low-productive peatlands can be re-used in many different ways. Some of these areas may be suitable for peat harvesting, which is planned to be continued at least for the next decades to safeguard domestic energy production? Areas with high ecological or wildlife values could be restored. The problem is that the impacts of different reuse options on biodiversity, environment and economy are not yet fully understood and thus it is hard to give proposals for re-use actions. The challenge is to develop mechanisms that can balance the conflicting demands on the use of peatlands and to ensure their sustainable use.

PROJECT LEADER
Professor Anne Tolvanen
Address: PO Box 413, FI-90014 Oulun yliopisto, FINLAND
Phone: +358 29 532 3782
E-mail: anne.tolvanen(a)luke.fi

PROJECT COORDINATOR
Miia Parviainen
Address: PO Box 413, FI-90014 Oulun yliopisto, FINLAND
Phone: +358 29 532 3848
E-mail: miia.parviainen(a)luke.fi

DURATION
2013–2018

RESEARCH PROGRAMME
MMK

Photo: Metla/Erkki Oksanen

Luke
NATURAL RESOURCES INSTITUTE FINLAND

Thank you!

Luke
NATURAL RESOURCES
INSTITUTE FINLAND