The spread of *Ailanthus altissima* in Switzerland

Monte Verità, November 2, 2016

Jan Wunder, Simon Knüsel, Daniela Gurtner & Marco Conedera

Tree of heaven

Ailanthus altissima
(臭椿)

-Native to China

-Introduced during the 19th century

-First occurrence in forests: ca. 1920

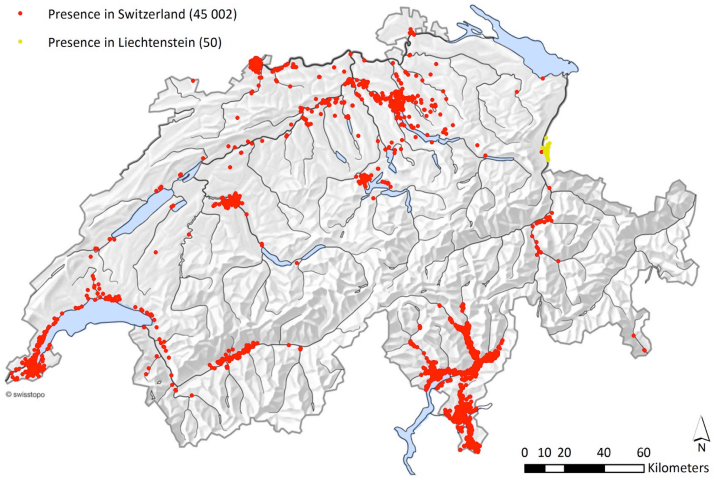
-Strong regeneration

-High drought tolerance

Photo: M. Conedera (2003)

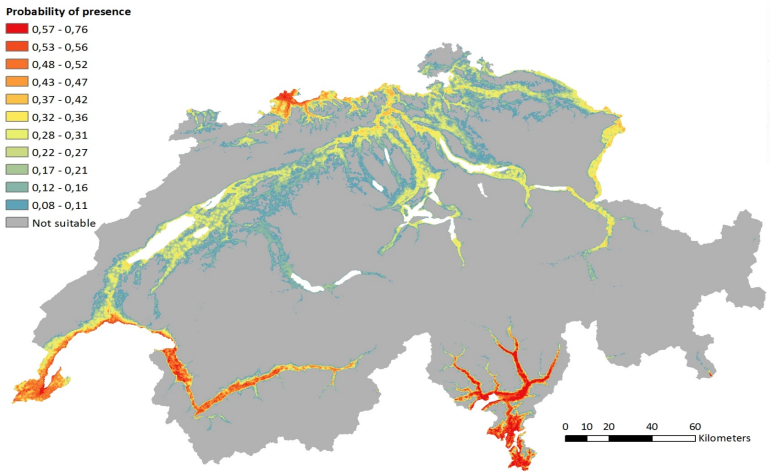
Jan Wunder jan.wunder@wsl.ch Swiss Federal Research Institute WSL

Current distribution of *Ailanthus* in Switzerland



Source: Gurtner (2015)

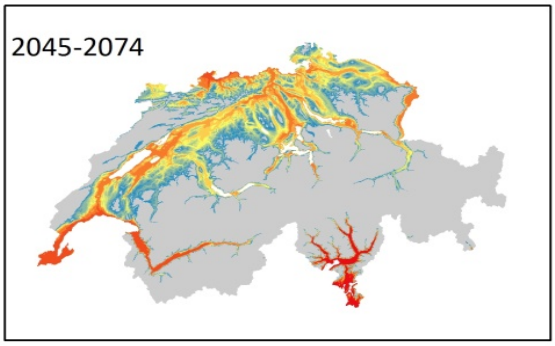
Modelled distribution of *Ailanthus* in Switzerland



Source: Gurtner (2015), Gurtner & Wunder (2015)

Projected distribution of *Ailanthus* in Switzerland

RCP 45 moderate climate scenario (IPCC)



Probability of presence
- 0,07 - 0,11
- 0,12 - 0,16
- 0,17 - 0,22
- 0,23 - 0,27
- 0,28 - 0,32
- 0,33 - 0,38
- 0,39 - 0,44
- 0,45 - 0,50
- 0,51 - 0,55
- 0,56 - 0,76

N

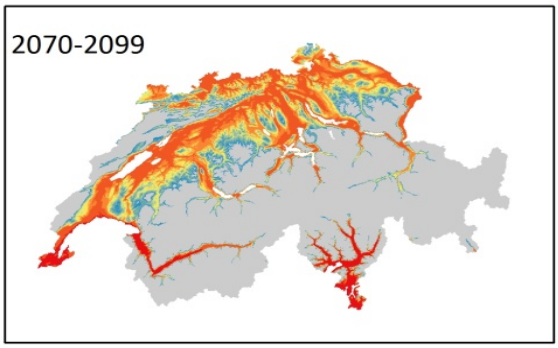
0 40 80 120 Kilometers

Source: Gurtner (2015), Gurtner & Wunder (2015)

WSL

Projected distribution of *Ailanthus* in Switzerland

RCP 45 moderate climate scenario (IPCC)



Probability of presence
- 0,07 - 0,11
- 0,12 - 0,16
- 0,17 - 0,22
- 0,23 - 0,27
- 0,28 - 0,32
- 0,33 - 0,38
- 0,39 - 0,44
- 0,45 - 0,50
- 0,51 - 0,55
- 0,56 - 0,76

N

0 40 80 120 Kilometers

Source: Gurtner (2015), Gurtner & Wunder (2015)

WSL

Risk 1: Reduced biodiversity

Photos: M. Conedera

Risk 2: Reduced forest stability

Abbildung 1: Kernfäule bei den gefällten Götterbäumen in SanVittore. (Bild: Luca Plozza)

Plozza & Schmid, Bündnerwald 2012

Photo: J. Wunder

Rockfall experiment (ALIEN Project)
www.wsl.ch/alienproject

Source: IRSTEA Grenoble

Rockfall experiment (ALIEN Project)
www.wsl.ch/alienproject

Source: IRSTEA Grenoble

Rockfall experiment (ALIEN Project)
www.wsl.ch/alienproject

Source: IRSTEA Grenoble

Rockfall experiment (ALIEN Project)
www.wsl.ch/alienproject

Source: IRSTEA Grenoble

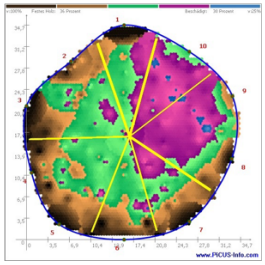
Rockfall experiment (ALIEN Project)
www.wsl.ch/alienproject

Source: IRSTEA Grenoble

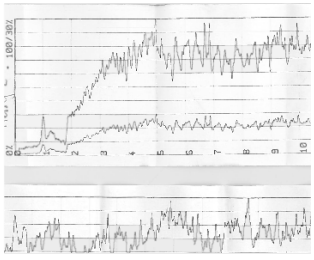
Heart rot decay

Rotfinder

Picus Tomograph

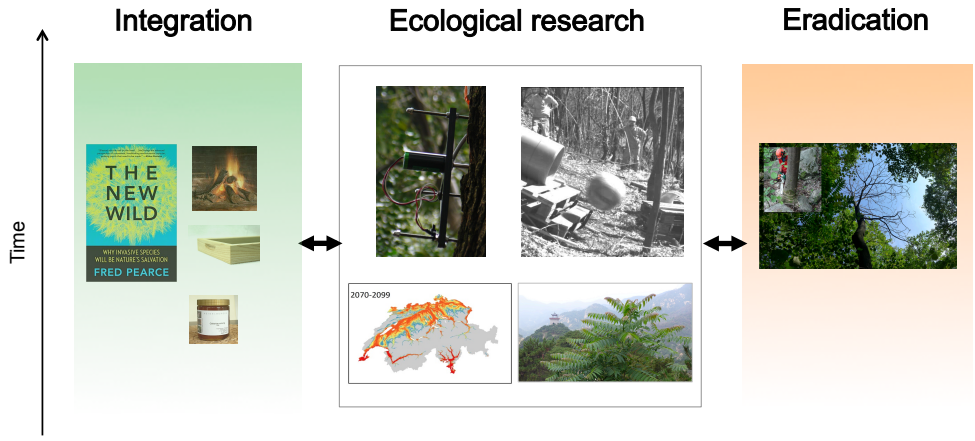


Resistograph



Photos: S. Knüsel (2016)

Conclusions



Better management of neophytic trees in Switzerland & Central Europe

Jan Wunder jan.wunder@wsl.ch Swiss Federal Research Institute WSL

Thank you!

Andi Rigling, Maihe Li, Patrick Fonti, Antonella De Angelis, Boris Pezatti, Franco Fibbioli, Patrick Schleppi, Roman Zweifel, Dirk Schmatz, Anne Verstege (all WSL)

Jianfeng Liu, Yanyan Ni (all Research Institute of Forestry, Chinese Academy of Forestry, Beijing)

Luuk Dorren, Christine Moos, Jean-Jacques Thormann, Andrea de Boni, Florim Sabani, Nicola Calanca (all HAFL Zollikofen)

Björn Reineking, Frédéric Berger, Franck Bourrier, Austin Haffenden, David Toe (all IRSTEA Grenoble), Markus Stoffel, Daniel Trappmann (all Uni Bern), Harald Bugmann, Lea Bauer (all ETH Zurich)

Giorgio Moretti, Maruska Anzini (TI), Luca Plozza, Ueli Bühler/Marco Vanoni (GR), Martin Ziegler (ZG), Patrick Insinna (Fürstentum Liechtenstein), Andreas Kunz (GSZ), Gabriele Carraro (Dionea) Cantons of Switzerland, Info Flora, LFI

Funded by:

FNSNF Swiss National Science Foundation · ANR · WSL · Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra Bundesamt für Umwelt BAFU · Landesverwaltung Fürstentum Liechtenstein · Stadt Zürich

Jan Wunder jan.wunder@wsl.ch Swiss Federal Research Institute WSL