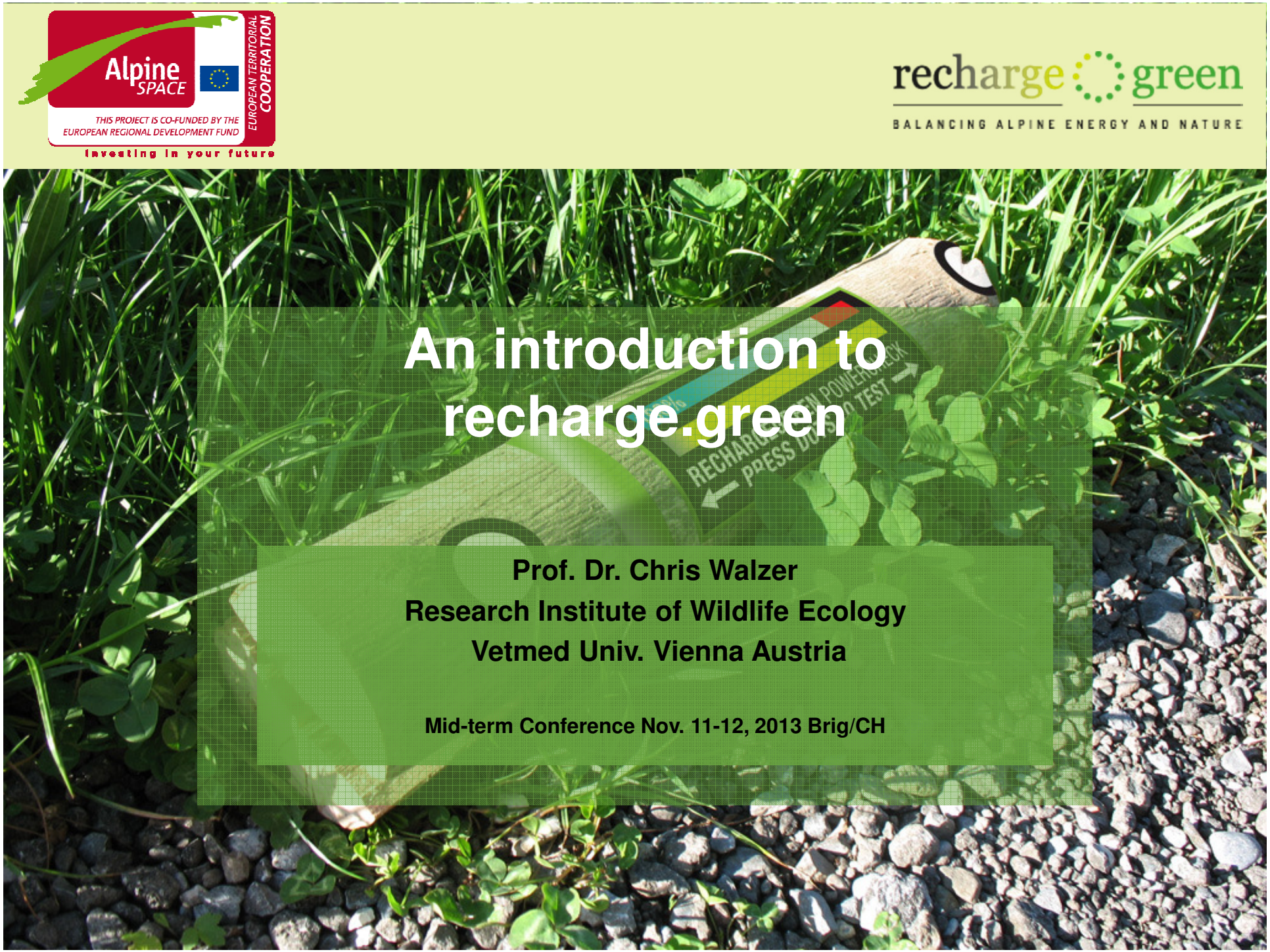
Alpine SPACE
EUROPEAN TERRITORIAL COOPERATION
THIS PROJECT IS CO-FUNDED BY THE EUROPEAN REGIONAL DEVELOPMENT FUND
investing in your future
recharge green
BALANCING ALPINE ENERGY AND NATURE
An introduction to recharge.green
Prof. Dr. Chris Walzer
Research Institute of Wildlife Ecology
Vetmed Univ. Vienna Austria
Mid-term Conference Nov. 11-12, 2013 Brig/CH

Project framework

recharge green

Aim:

To provide the basis for balancing Alpine renewable energy production and nature conservation

- Co-funded by Alpine Space Programme /ERDF
  (Total budget: 2,7 mio €)

- Duration: October 2012 – June 2015

A multi-country collaboration

- 14 (16) partners in 5 (6) Alpine countries

- 5 project pilot areas:
  - Bavaria (Germany),
  - Belluno Province, Veneto (Italy),
  - Northern French Alps(France),
  - Triglav National Park (Slovenia), and
  - Vorarlberg (Austria).


Lac de Moiry, Photo S. Rosset, CC

Diapositiva 3

KS2 M.E. sind es nur mehr 14 Partner, da Alpi Marittime und Agroscope CH wegfallen, oder? Wenn Agroscope noch dabei ist, dann 15 Partner und 6 Länder!

Karin Svadlenak-Gomez; 08/11/2013

Partners

recharge green

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EUROPEAN TERRITORIAL COOPERATION

Investing in your future

Austria

- Environment Agency Austria
- Institute for Geography, University of Innsbruck
- International Institute for Applied Systems Analysis
- Regional Development Vorarlberg
- Research Institute of Wildlife Ecology, lead partner

France

- Mountain Institute

Germany

- Bavarian electric power company
- blue! advancing european projects (sub-contracted by the lead partner)
- International Commission for the Protection of the Alps

Italy

- European Academy of Bozen/Bolzano
- Maritime Alps nature park
- Veneto Region / Office for Ecc[illegible]s and the Development of Mountain Areas

KS4

Slovenia

- Agricultural Institute of Slovenia
- Department for forestry and renewable forest resources, University of Ljubljana
- Slovenia Forest Service
- Triglav National Park

Swi[illegible]nd

KS3

- Agroscope – Swiss research into agriculture, nutrition and the environment

Diapositiva 4

KS3 Gehört wohl eher nicht mehr dazu?
Karin Svadlenak-Gomez; 08/11/2013

KS4 Alpi Marittime gehört wohl raus?
Karin Svadlenak-Gomez; 08/11/2013

For „ground-truthing“: different emphases in pilot areas

Woodland biomass vs. biodiversity (Triglav)

Hydropower vs. biodiversity (Bavaria, Belluno)

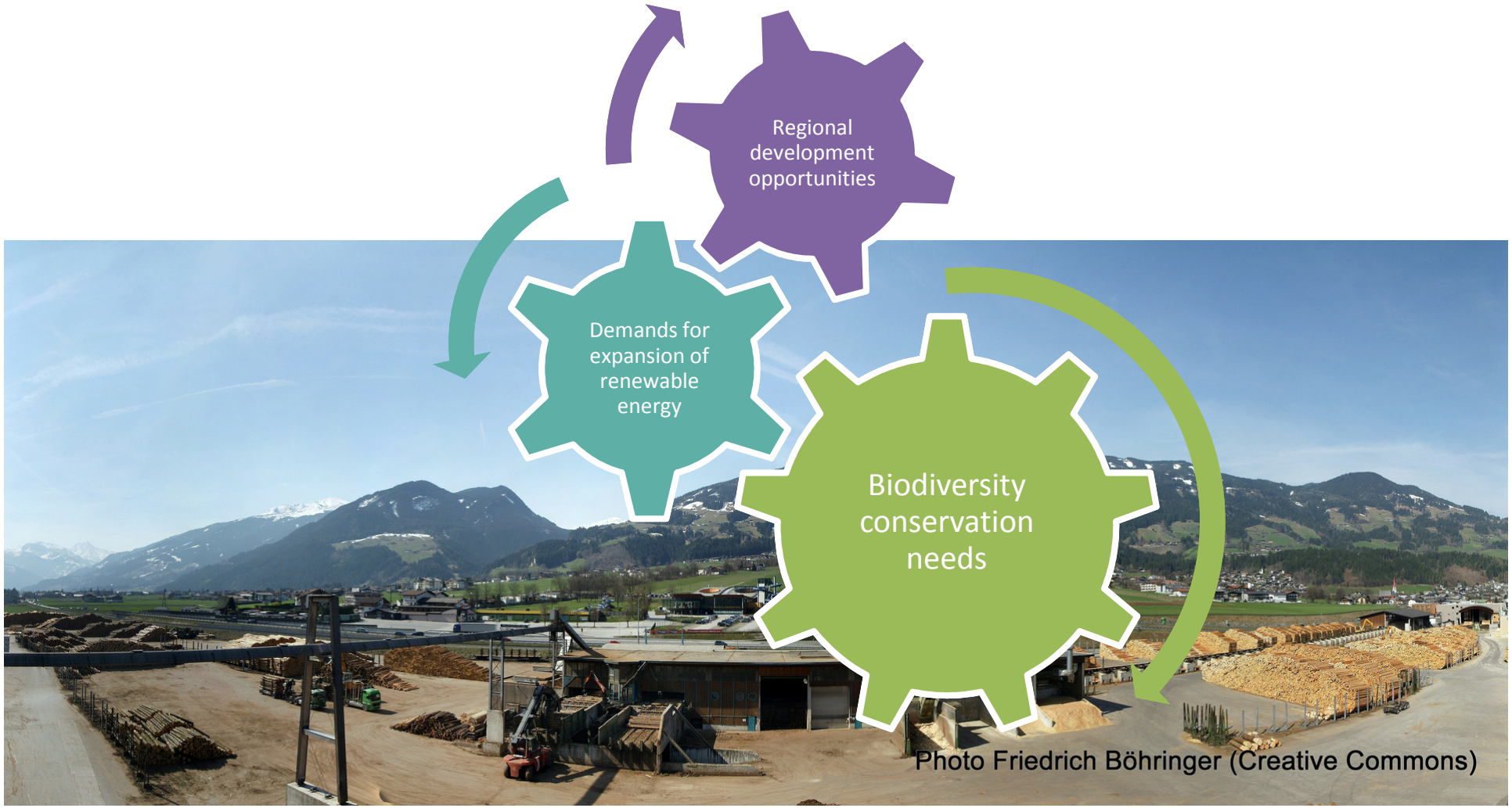
All forms of RE vs. ecosystem services (Vorarlberg)

Hydropower & integrated spatial decision support systems on water resource management (Northern French Alps)

Why this project?

- One of the largest natural spaces in Europe
- European Biodiversity hotspot
- Home and workplace for 14 million people
- Holiday and recreation destination for 100 million +

Why this project?



Context

Environmental, social & economic issues

Demand for:

- sustainable sources of energy (climate change mitigation)
- economic development in the region

vs.

Conservation of:

- Ecological connectivity
- Biodiversity (species, ecosystems)
- Ecosystem services

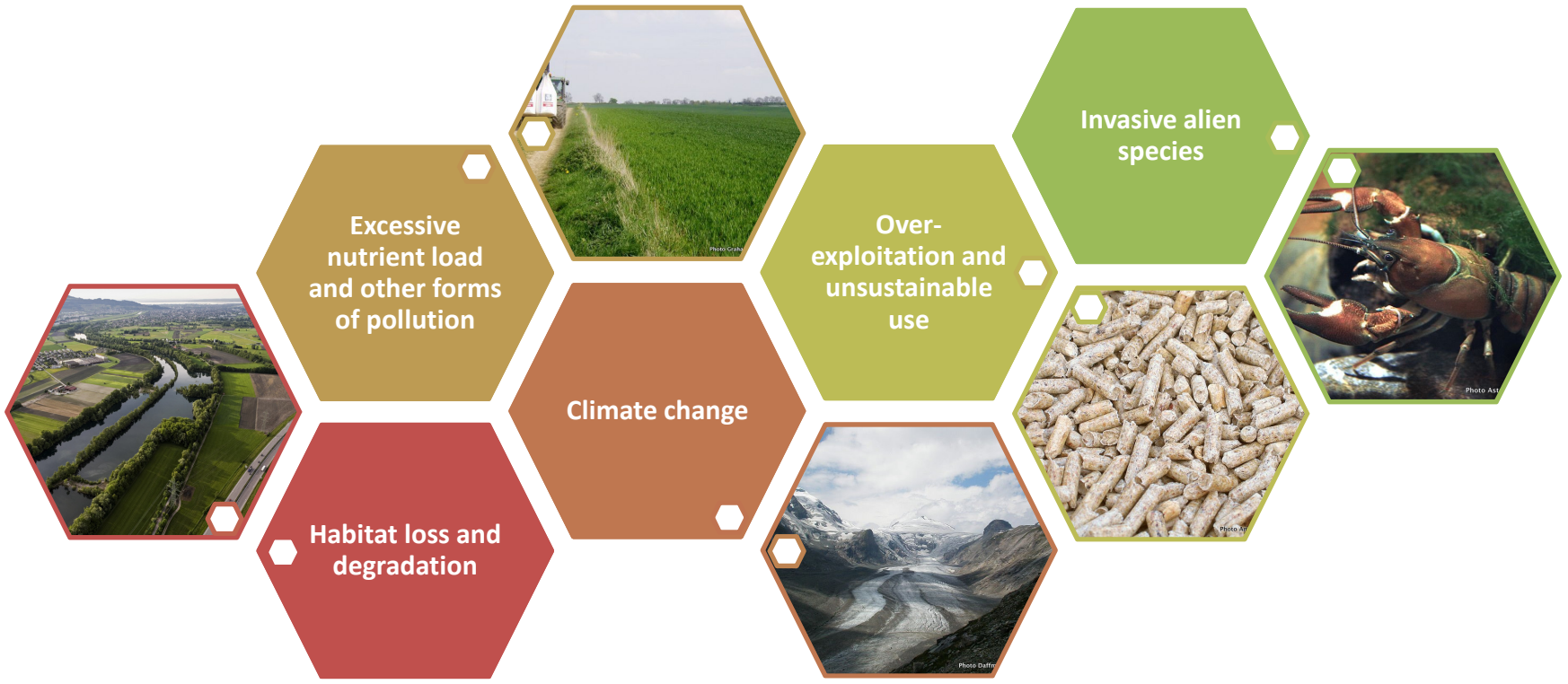
Questions

- impact of development of renewable energy on the habitats of animals and plants?
- How does it affect land use and soil quality?
- How much renewable energy can reasonably be produced / used?

What ecosystem services?

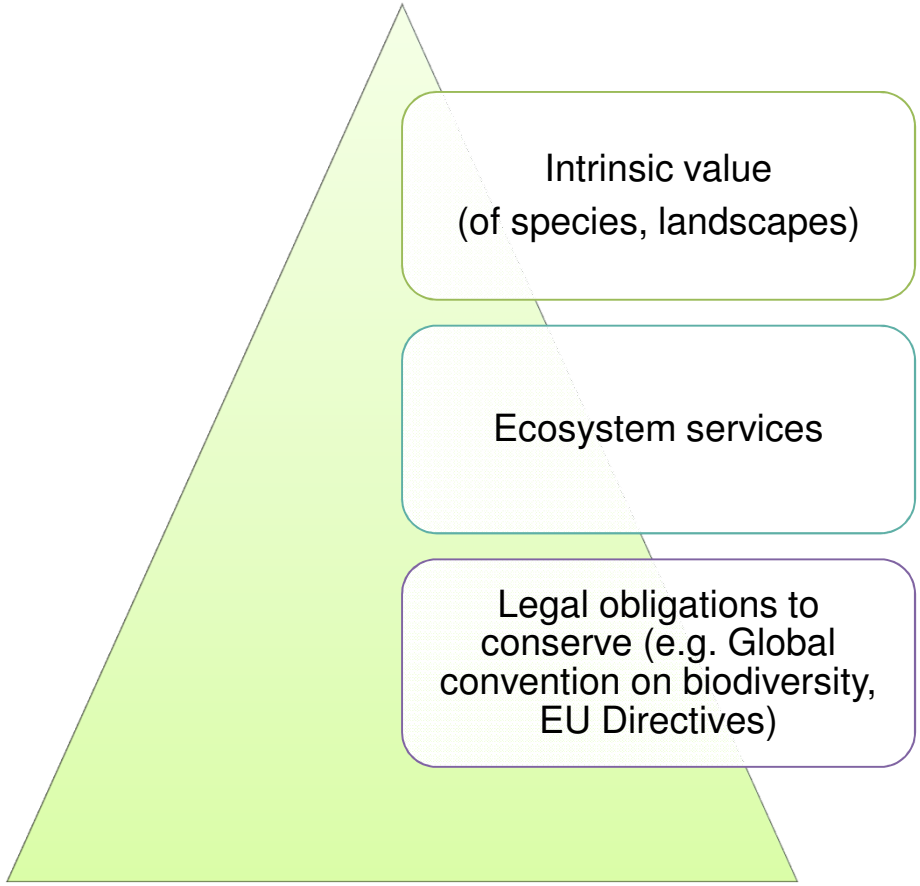
Source: Richard Hastik, Uni Innsbruck

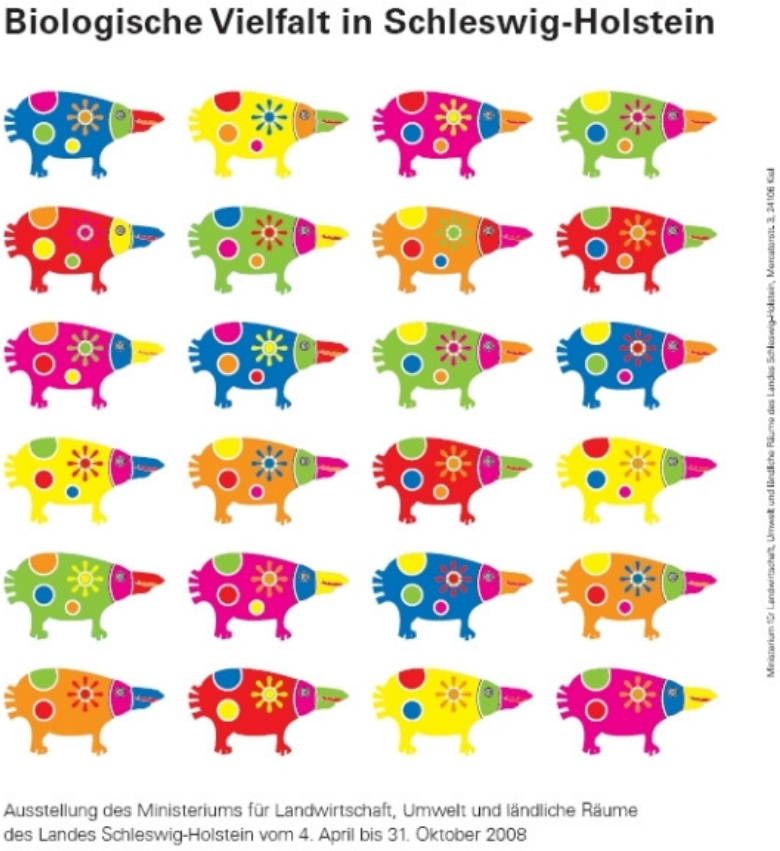
The 5 principal pressures on biodiversity



(Adapted from **Global Biodiversity Outlook 2010)**

Why care about biodiversity?





Why care about biodiversity?

During the 1980s it was shown that organisms can influence:

- formation of habitats – ecosystem engineering
- fluxes in biogeochemical cycles
- productivity of ecosystems

Cardinale et al. Nature 2012

Why care about biodiversity?

By the 1990s studies suggested that ES functions like biomass production and nutrient cycling respond strongly to changes in biodiversity.

Several hundred papers reported on > 600 experiments that manipulated 500+ types of organisms in freshwater, marine and terrestrial ecosystems

Cardinale et al. Nature 2012

Present-day consensus

Biodiversity loss reduces:

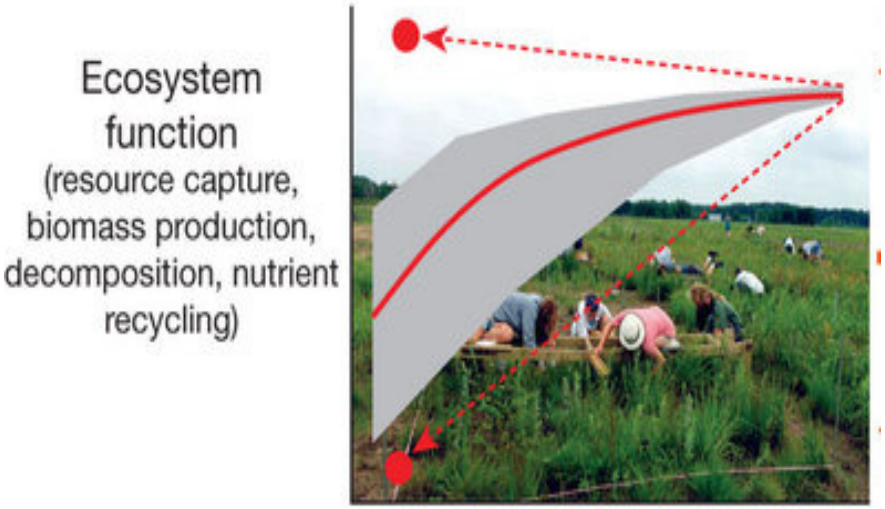
- efficiency by which ecological communities capture biologically essential resources
- produce biomass
- decompose and recycle essential nutrients

Mounting evidence that biodiversity increases stability of ES functions over time

Cardinale et al. Nature 2012

Present-day consensus

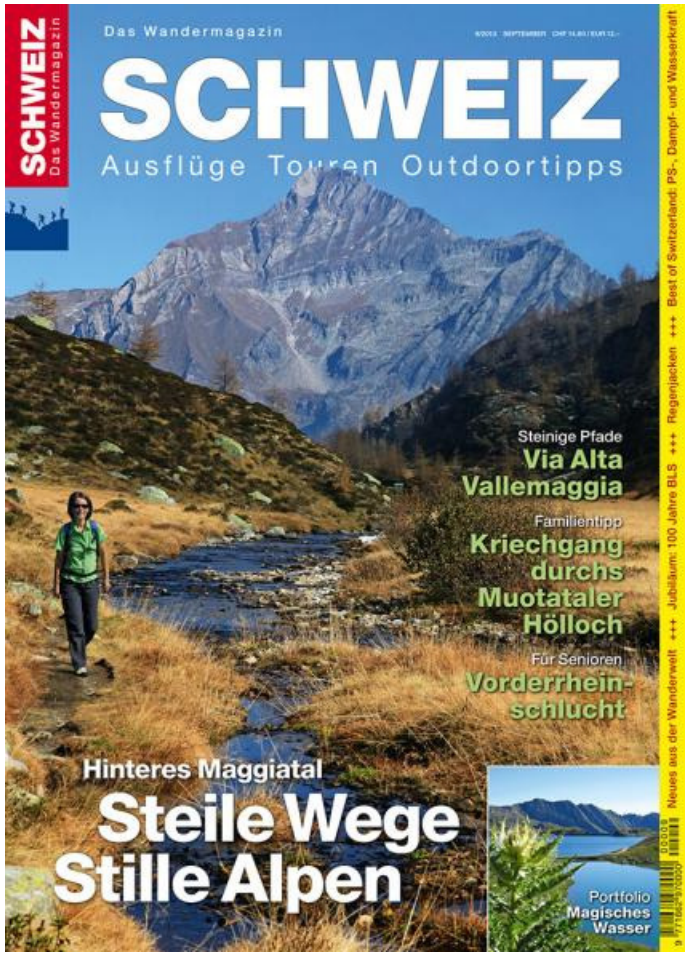
Impact of biodiversity on any single ES process is non-linear and saturating – change accelerates as biodiversity loss increases



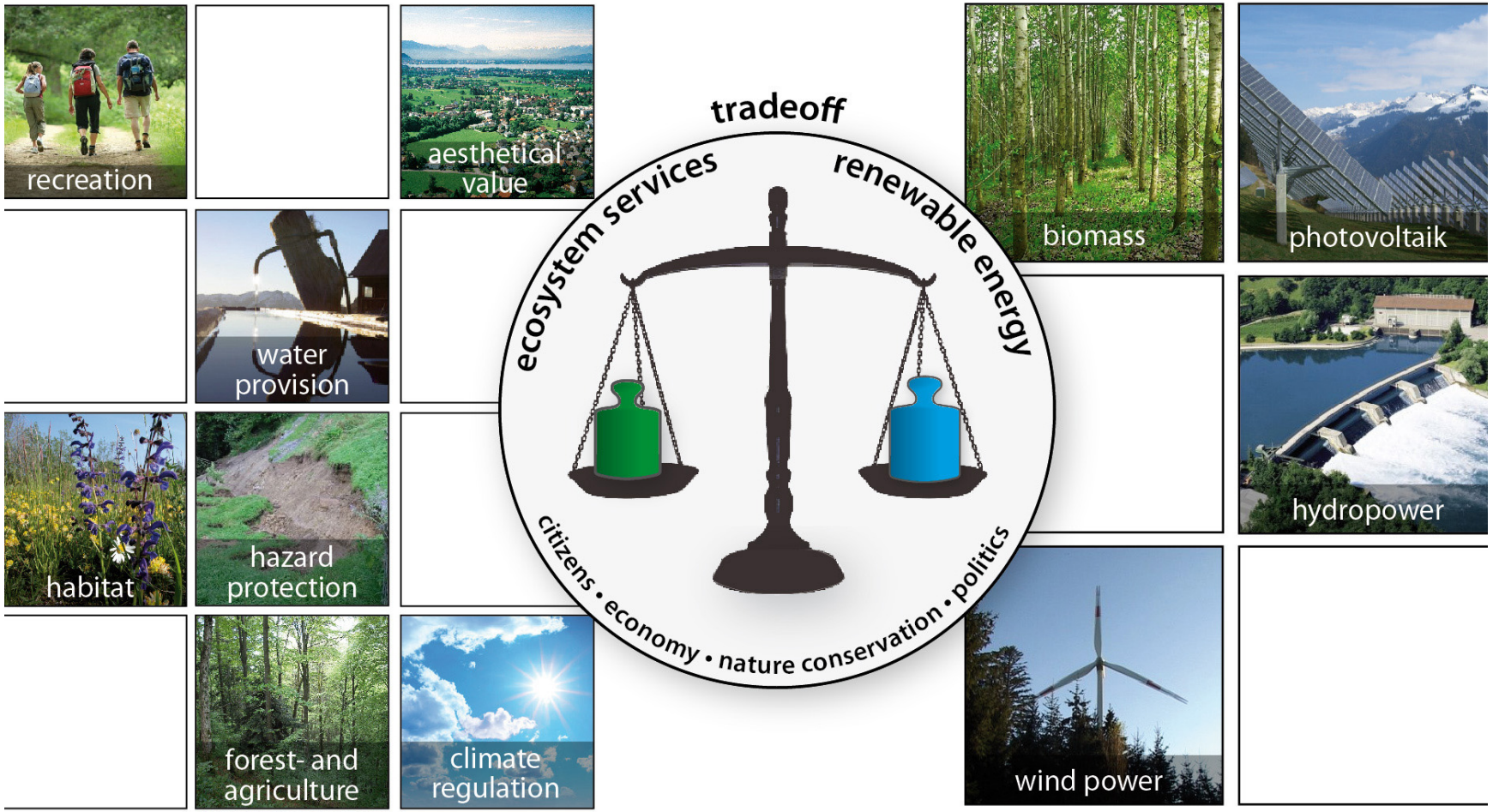
Cardinale et al. Nature 2012

Present-day consensus

A functioning and resilient ecosystem is the foundation for the provision of services

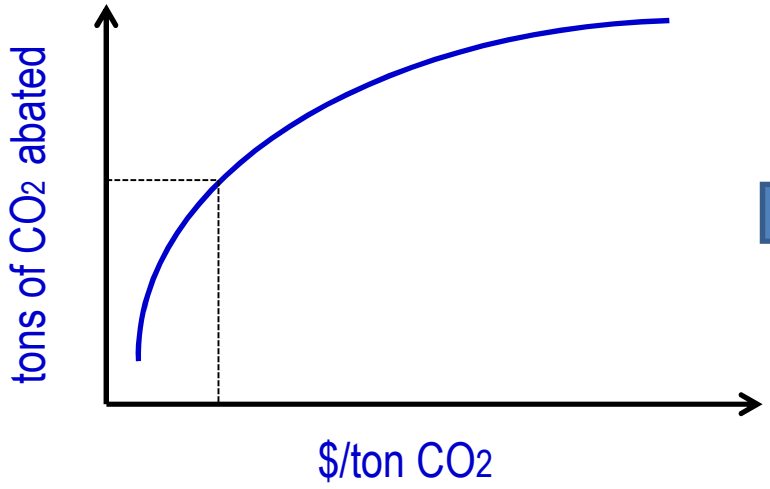


But – there are tradeoffs



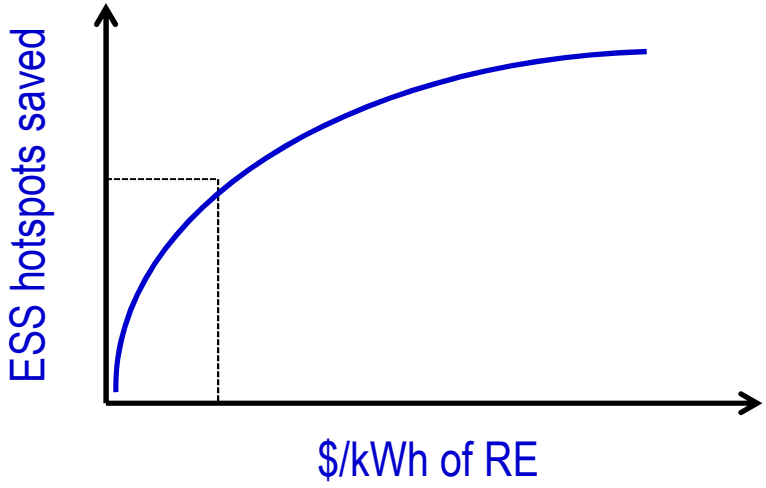
Source: Richard Hastik, Uni Innsbruck

MAC



Each additional ton of CO2 abated will increase the cost of abating the next one, as low-cost opportunities are exploited and more expensive abatement options have to be employed.

MPC



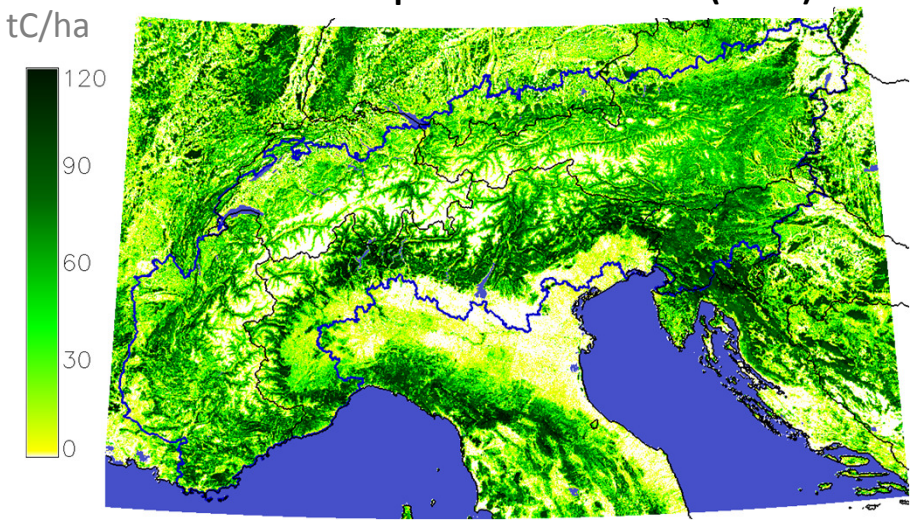
Each additional area with important ESS excluded from RE deployment/protected will increase the cost of delivering another kWh of RE, as we have to resort to less productive areas.

Ecosystem trade-offs of forest areas

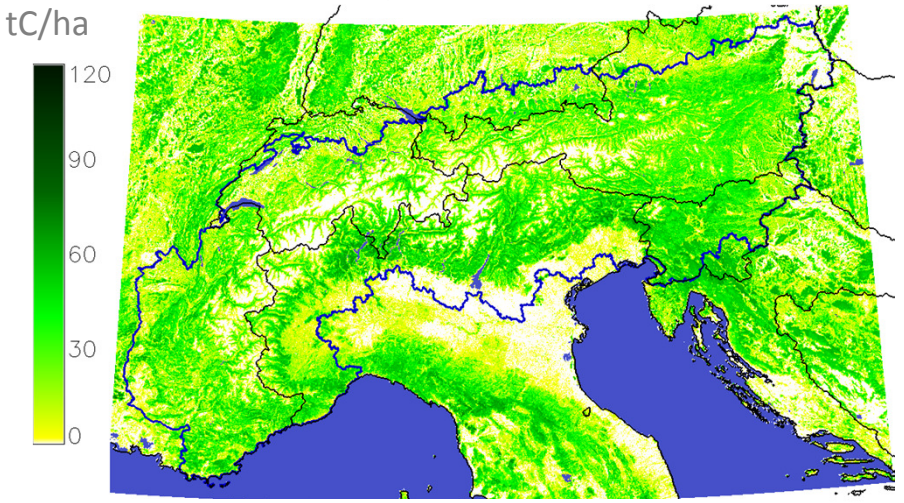
- **G4M** estimates the impact of forestry activities on carbon sequestration and supply of biomass in the Alps (258,000 km² total area, 115,000 km² forest).
- Forests managed to maximize two ecosystem values through changing the rotation period:
  - S1: Maximization of carbon stock in forests.
  - S2: Maximization of biomass production.

	S1: Carbon sequestration	S2: Biomass production
Harvest potential (Mt C /year):	11	23
Carbon stock (Mt C):	1,057	577

1: Carbon sequestration scenario (stock)

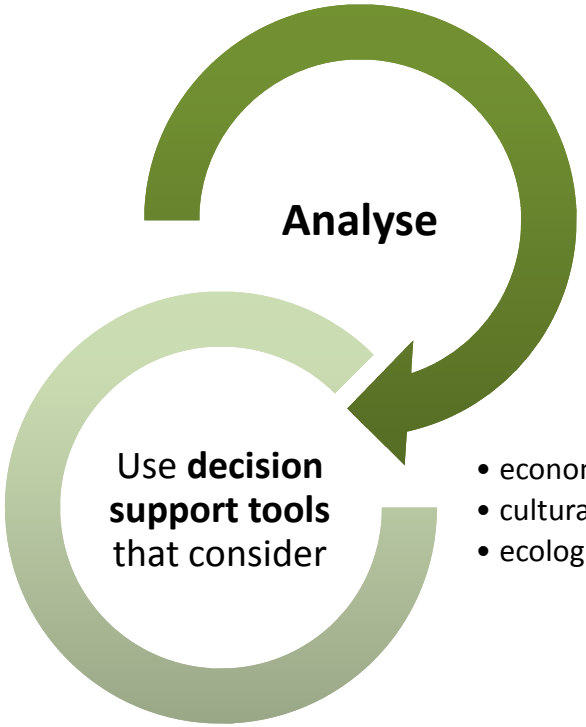


2: Biomass production scenario (stock)



Source: G4M www.iiasa.ac.at/g4m

So – how to find the right balance?



- Stakeholder needs
- Ecological processes
- Economic aspects
- Energy potential and market drivers
- Legal and policy environment

- economic,
- cultural, and
- ecological tradeoffs


Photo: yogaguide.at

Expected project results

Assessment of the **status quo of Alpine renewable energy production** and of potential (with maps)

A set of **qualitative indicators** to compare legal frameworks, stakeholders, processes, energy market drivers, avenues of cooperation

A **trade-off analysis** (renewable energy production vs. biodiversity conservation/ecosystem services)

A **decision-support system** for renewable energy development considering ecological trade-offs and economic dimensions


Photo Leo Setä (CC)

Thank you!

chris.walzer@fiwi.at

Research Institute of Wildlife Ecology

www.fiwi.at

Visit the project website: www.recharge-green.eu

& Subscribe to our newsletter! (available in English, German, French, Italian, Slovenian)

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