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**Preparedness to climate change in European  
forestry based on COST ECHOES database on  
adaptive measures**

**ECHOES and MOTIVE open science conference**

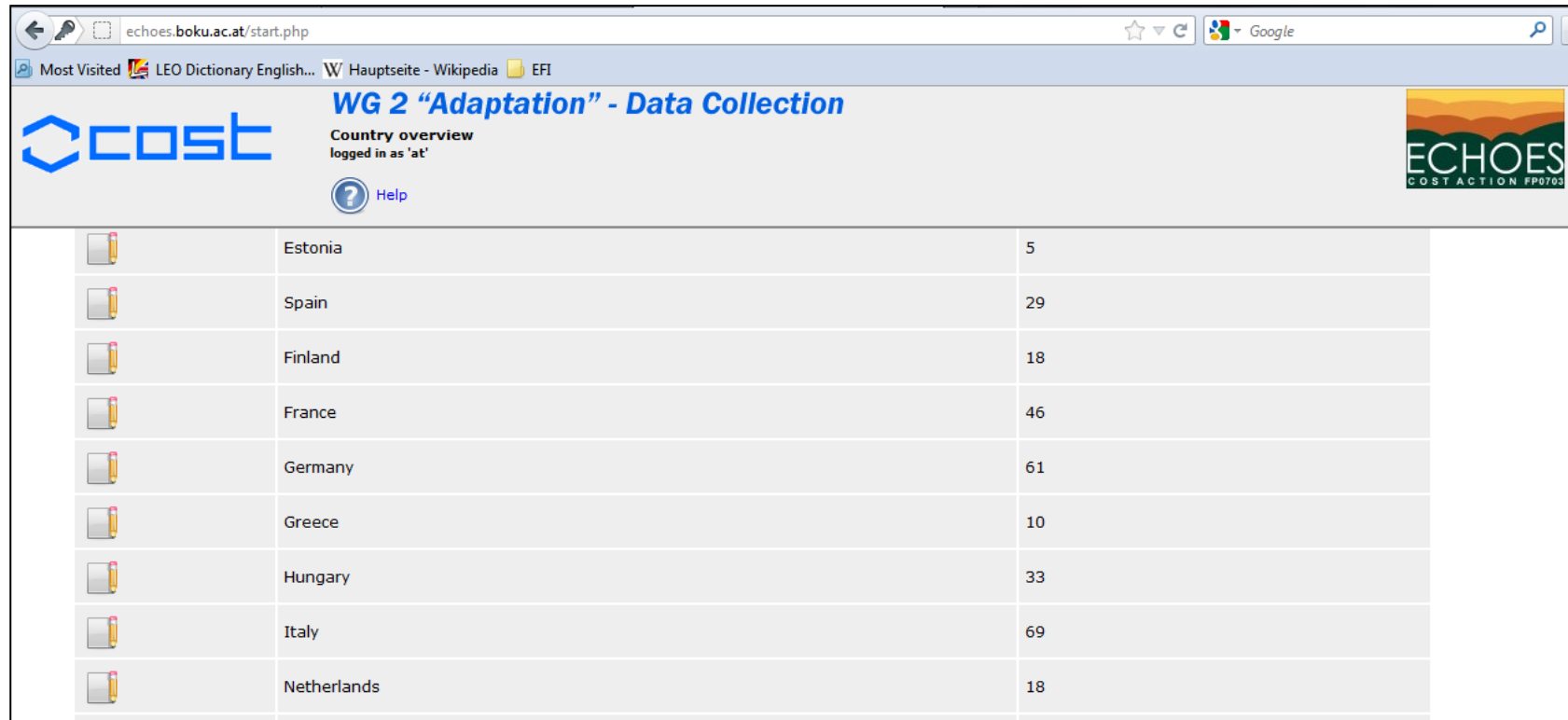
**May 21-24, 2012, Tours, France**












# Objectives and outline of presentation

- To scrutinize contents of ECHOES adaptive measures database
  - To assess the preparedness to climate change in different bioclimatic regions
1. Introduce ECHOES Adaptive Measures Database
  2. Regional distribution and implementation status of measures
  3. Coverage across European Forest Types
  4. What determines the choice of measures?
  5. Conclusion: how well prepared are we?

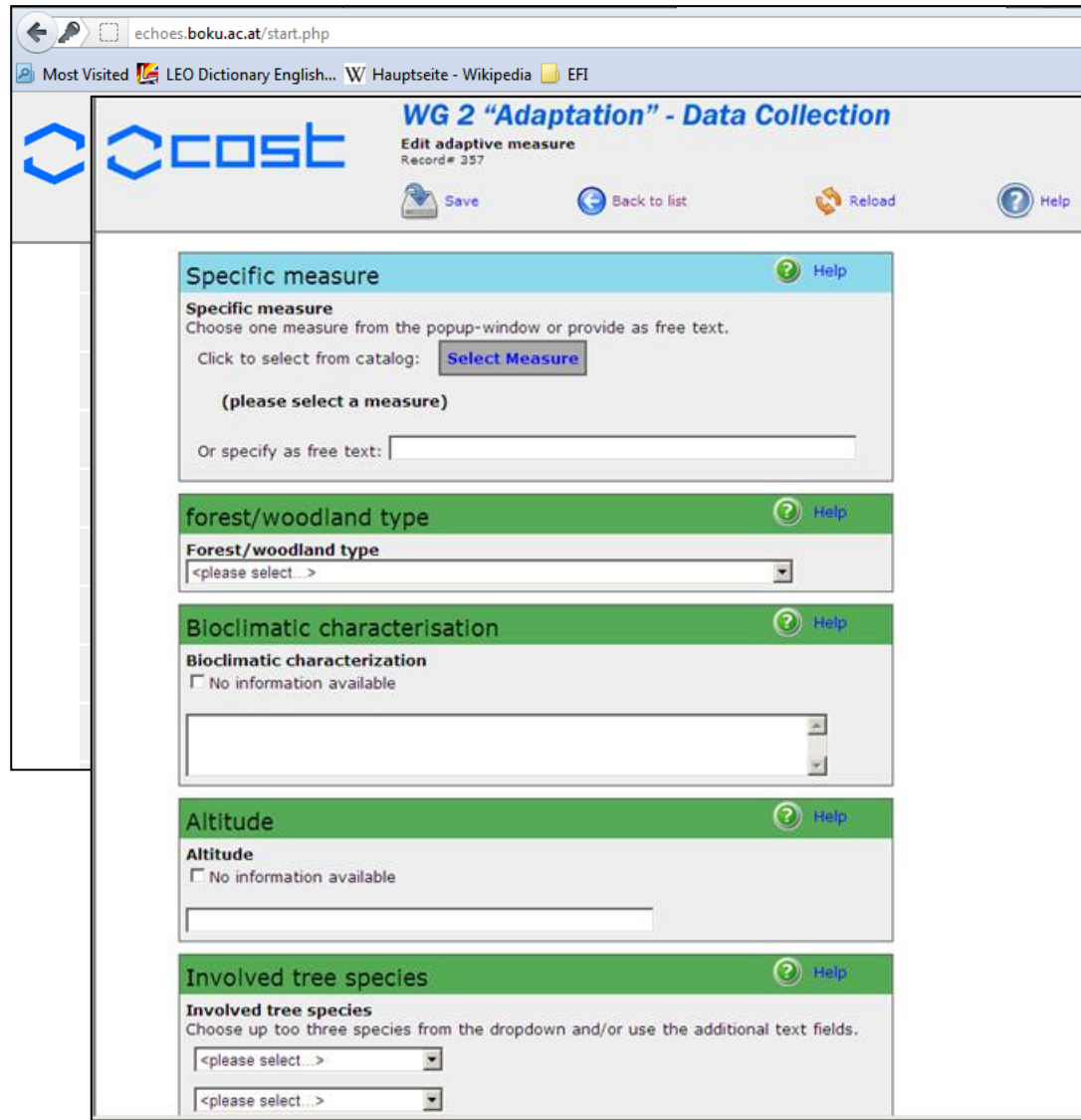
# ECHOES Data Base on Adaptive Measures



The screenshot shows a web browser window with the URL `echoes.boku.ac.at/start.php`. The page title is **WG 2 "Adaptation" - Data Collection**. Below the title, it says "Country overview" and "logged in as 'at'". There is a "Help" link with a question mark icon. On the right side, there is a logo for ECHOES COST ACTION FP0703. The main content is a table with the following data:

|   |             |    |
|---|-------------|----|
|  | Estonia     | 5  |
|  | Spain       | 29 |
|  | Finland     | 18 |
|  | France      | 46 |
|  | Germany     | 61 |
|  | Greece      | 10 |
|  | Hungary     | 33 |
|  | Italy       | 69 |
|  | Netherlands | 18 |

# ECHOES Data Base on Adaptive Measures



The screenshot shows the 'WG 2 "Adaptation" - Data Collection' interface. It includes a header with the 'cost' logo and navigation buttons like 'Save', 'Back to list', 'Reload', and 'Help'. The main content area contains several form sections:

- Specific measure:** A section with a 'Help' icon and a 'Select Measure' button. It prompts the user to 'Choose one measure from the popup-window or provide as free text.' Below this is a text input field with the placeholder '(please select a measure)'. An alternative option is 'Or specify as free text:' followed by another text input field.
- forest/woodland type:** A section with a 'Help' icon and a dropdown menu currently showing '<please select...>'.
- Bioclimatic characterisation:** A section with a 'Help' icon and a checkbox labeled 'No information available'. Below it is a dropdown menu.
- Altitude:** A section with a 'Help' icon and a checkbox labeled 'No information available'. Below it is a text input field.
- Involved tree species:** A section with a 'Help' icon and two dropdown menus, both currently showing '<please select...>'. The text below the dropdowns says 'Choose up too three species from the dropdown and/or use the additional text fields.'

|             | # measures | # different measures |
|-------------|------------|----------------------|
| Austria     | 15         | 10                   |
| Croatia     | 9          | 9                    |
| Cyprus      | 21         | 15                   |
| Czech Rep.  | 23         | 9                    |
| Estonia     | 5          | 5                    |
| Finland     | 18         | 18                   |
| France      | 46         | 19                   |
| Germany     | 61         | 41                   |
| Greece      | 10         | 9                    |
| Hungary     | 33         | 32                   |
| Italy       | 69         | 26                   |
| Netherlands | 18         | 8                    |
| Serbia      | 7          | 5                    |
| Slovakia    | 34         | 15                   |
| Slovenia    | 26         | 6                    |
| Spain       | 29         | 26                   |
| Sweden      | 11         | 9                    |
| Switzerland | 38         | 21                   |
| UK          | 10         | 10                   |
| total       | 483        | 146                  |

# ECHOES Data Base on Adaptive Measures

|           | # measures | # different measures |
|-----------|------------|----------------------|
| Austria   | 15         | 10                   |
| Croatia   | 9          | 9                    |
| Cyprus    | 21         | 15                   |
| Czech Rep | 22         | 9                    |
|           |            | 5                    |
|           |            | 18                   |
|           |            | 19                   |
|           |            | 41                   |
|           |            | 9                    |
|           |            | 32                   |
|           |            | 26                   |
|           |            | 8                    |
|           |            | 5                    |
|           |            | 15                   |
|           |            | 6                    |
|           |            | 26                   |
|           |            | 9                    |
|           |            | 21                   |
|           |            | 10                   |
|           |            | 146                  |



# Context information

ECHOES WG2 Data collection - Windows Internet Explorer

http://echoes.boku.ac.at/view.php?id=-1&todo=new&country=at

File Bearbeiten Ansicht Favoriten Extras ?

ECHOES WG2 Data collection

**cost** **WG 2 "Adaptation" - Data Collection**

Edit adaptive measure  
Record# 357

Save Back to list Reload Help

**Management system** Help

**Management system**

<please select...>

<please select...>

- unmanaged/ nature reserve
- close to nature forestry (C2N) Help
- combined objective/ multi-purpose forestry
- intensive even-aged forestry
- coppice forestry (includes coppice, coppice with reserves, coppice with standards)
- short rotation forestry
- various management system (unspecific)

- cork
- berries
- carbon sequestration
- maintainance of biodiversity
- provision of drinking water
- protection against avalanches
- protection against rockfall
- protection against soil erosion
- game management/hunting
- various objectives (unspecific)

Add. objective:  (optional)

Add. objective:  (optional)

**Observed Impacts** Help

**Observed Impact**

No observed impacts

**Expected impacts** Help

**Expected impact**

until 2020

2021-2025



# Context information

ECHOES WG2 Data collection - Windows Internet Explorer

http://echoes.boku.ac.at/view.php?id=-1&todo=new&country=at

ECHOES WG2 Data collection

**WG 2 "Adaptation" - Data Collection**

**cost** Edit adaptive measure Record# 357

Save Back to list Reload Help

**Management**

Management

<please select...>

<please select...>

unmanaged/ nat

close to nature f

combined object

intensive even-ai

coppice forestry

short rotation for

various manager

cork

berries

carbon se

maintaina

provision o

protection

protection

protection

game man

various ob

Add. objective

Add. objective

**Observed**

**Observed Im**

No observe

**Expected**

**Expected impact**

until 2020

2021 2022

**Scale of measure** Help

Scale of measure

<please select...>

<please select...>

stand level

forest management unit level

higher levels (policy level, regional level, national level)

various scales (unspecific)

<please select...>

**Purpose of measure** Help

Purpose of measure

| purpose  | comments             |
|--|----------------------|
| <input type="checkbox"/> Reduce impacts?             | <input type="text"/> |
| <input type="checkbox"/> Increase adaptive capacity? | <input type="text"/> |

**Effectiveness** Help

Effectiveness

<please select...>

free text (optional):

**Potential trade offs** Help

Potential trade offs

# ECHOES Database: Number of measures by bioclimatic region and status

| Region       | Number of respondent countries in the region | Number of entries in the database |               |         |         |           | Number of different measures |
|--------------|--|-----------------------------------|---------------|---------|---------|-----------|------------------------------|
|              |  | Total                             | Idea/proposal | Ongoing | Planned | No status |                              |
| <b>N</b>     | 3  | 34                                | 11            | 19      | 3       | 1         | 27                           |
| <b>CW</b>    | 6  | 188                               | 47            | 106     | 28      | 7         | 77                           |
| <b>CE</b>    | 3  | 90                                | 3             | 23      | 62      | 2         | 43                           |
| <b>SW</b>    | 2  | 98                                | 37            | 56      | 5       |           | 47                           |
| <b>SE</b>    | 5  | 73                                | 16            | 56      | 1       |           | 32                           |
| <b>Total</b> | 19   | 483                               | 114           | 260     | 99      | 10        | 146                          |



Disturbances are not new:  
  
We know how to respond!  
(at least in theory)

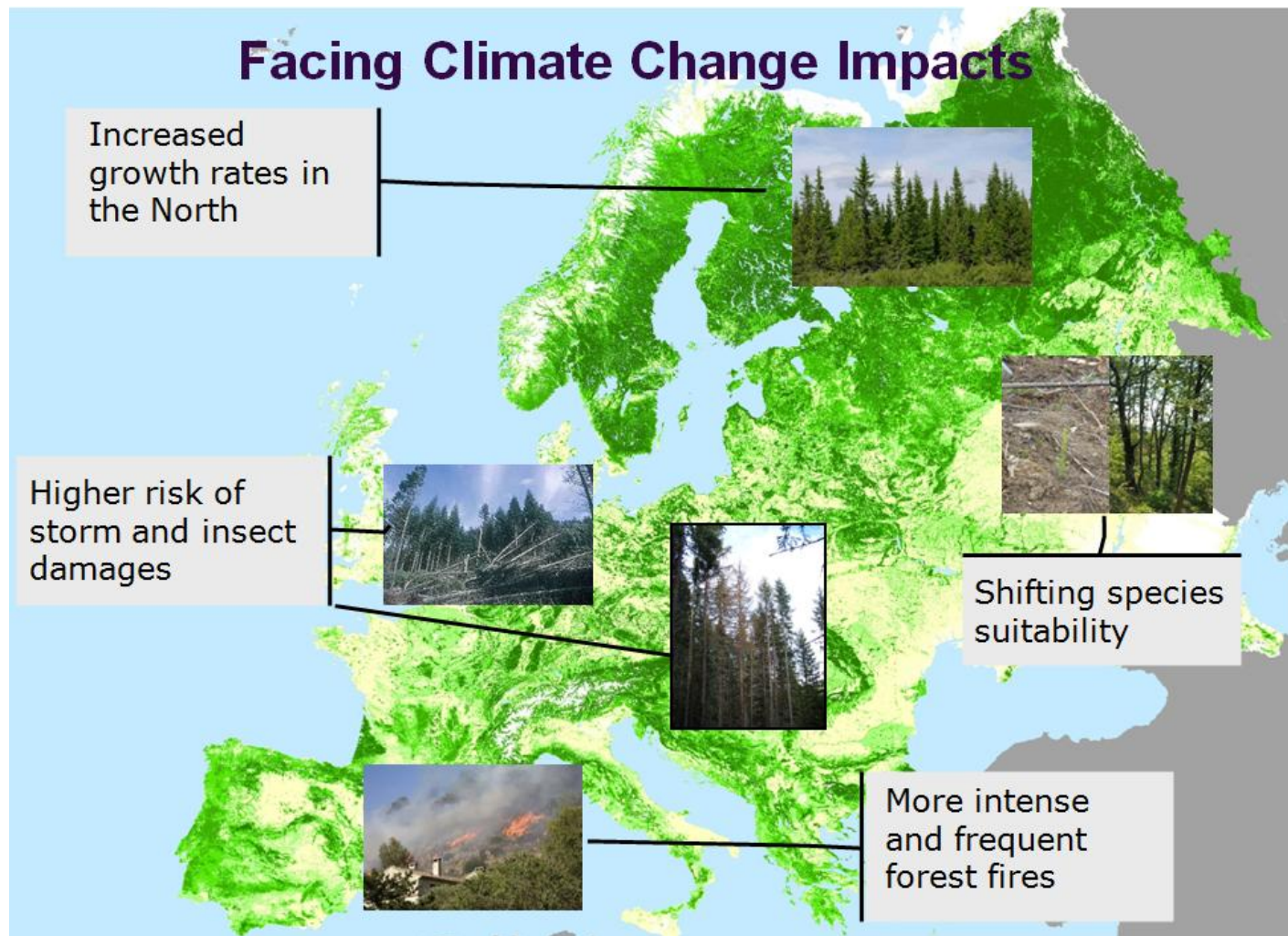


Foto: State Forests Tatra National Park, Slovakia

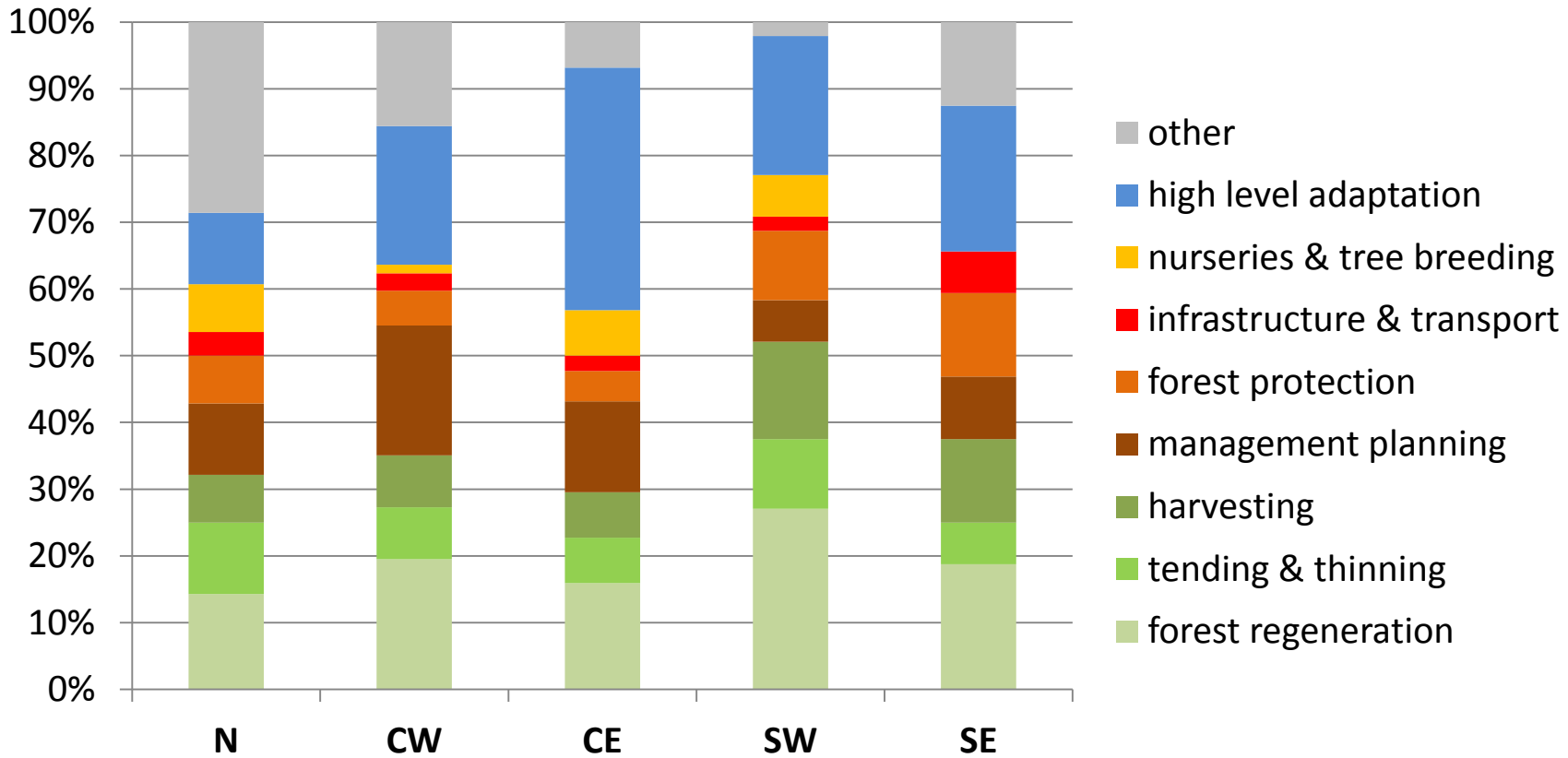
# Typical ongoing measures

|   | Total      | idea/<br>proposal | ongoing    | planned   | No status | %<br>ongoing |
|---|------------|-------------------|------------|-----------|-----------|--------------|
| <b><i>Tending &amp; Thinning</i></b>          |            |                   |            |           |           |              |
| 2.1. modify stand structure                   | 20         | 2                 | 15         | 2         | 1         | 75%          |
| <b><i>Forest protection</i></b>               |            |                   |            |           |           |              |
| 5.1. general preventive measures              | 13         | 2                 | 9          | 1         | 1         | 69%          |
| 5.3. manage disturbance risks                 | 8          | 1                 | 7          |           |           | 88%          |
| <b><i>Infrastructures &amp; transport</i></b> |            |                   |            |           |           |              |
| 6.4. disturbance management                   | 9          | 2                 | 6          | 1         |           | 67%          |
| <b><i>all</i></b>                             | <b>483</b> | <b>114</b>        | <b>260</b> | <b>99</b> | <b>10</b> | <b>54%</b>   |

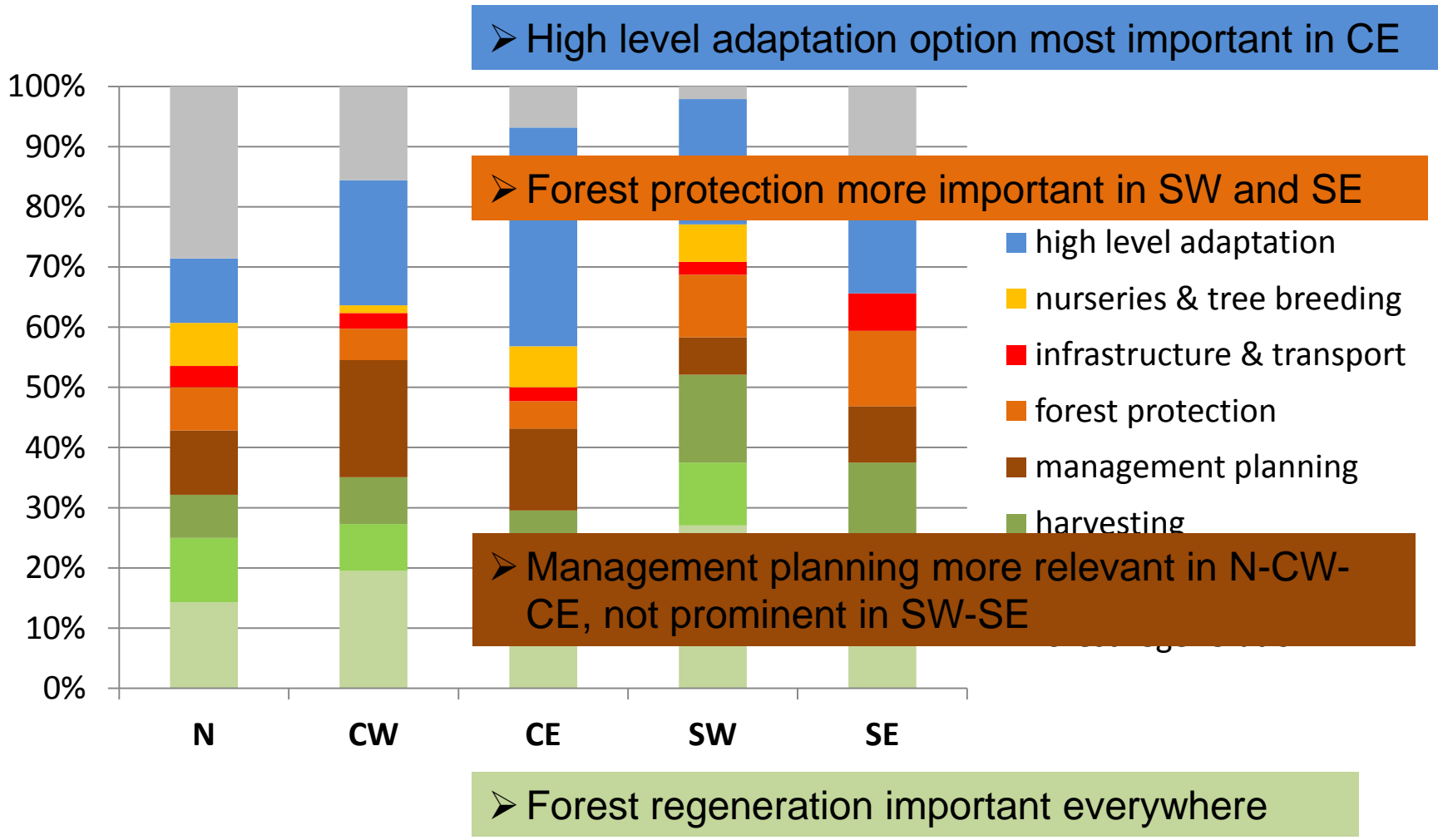
# What type of measure is relevant where?



# Type of measure per region

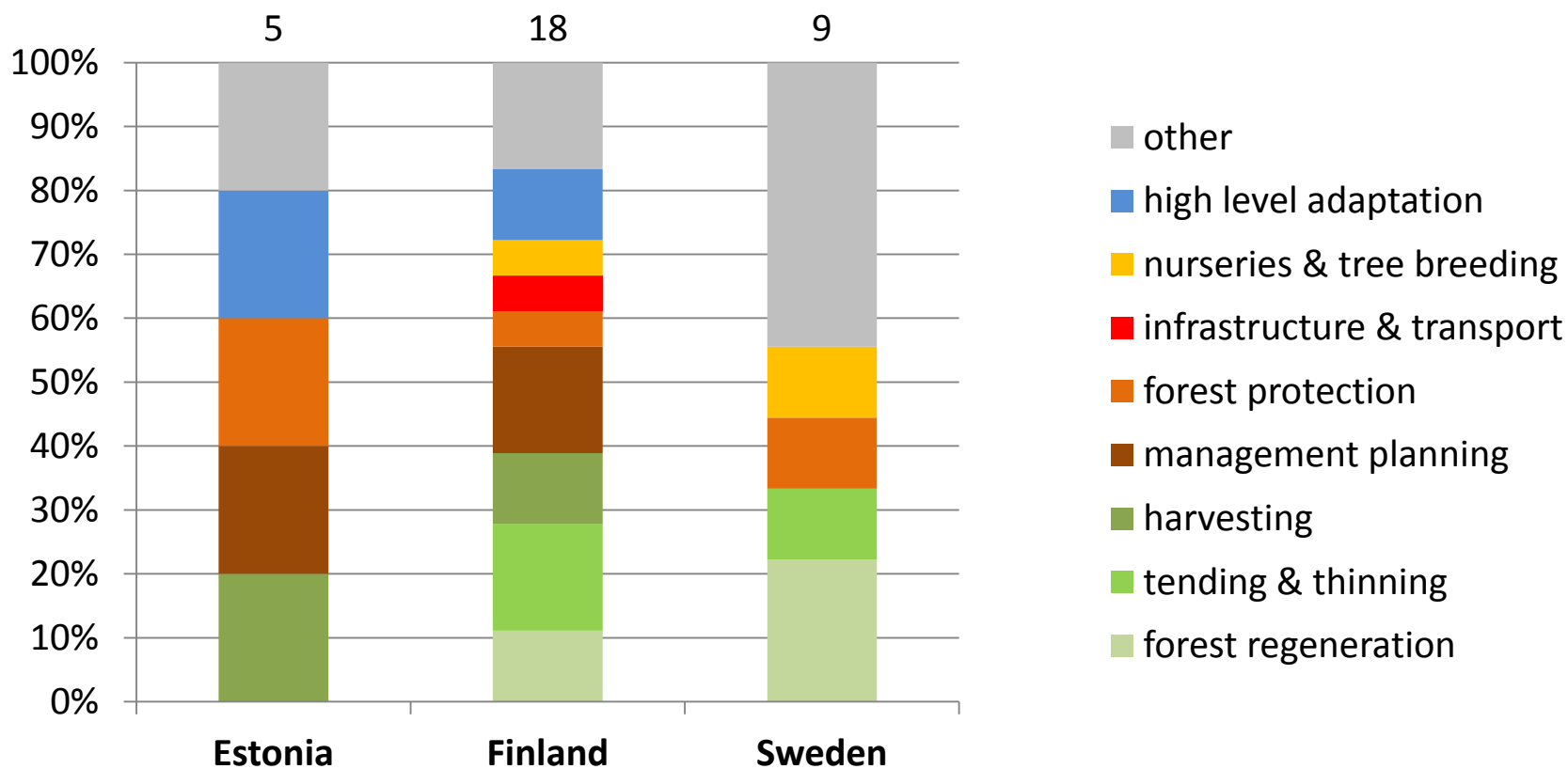


# Type of measure per region



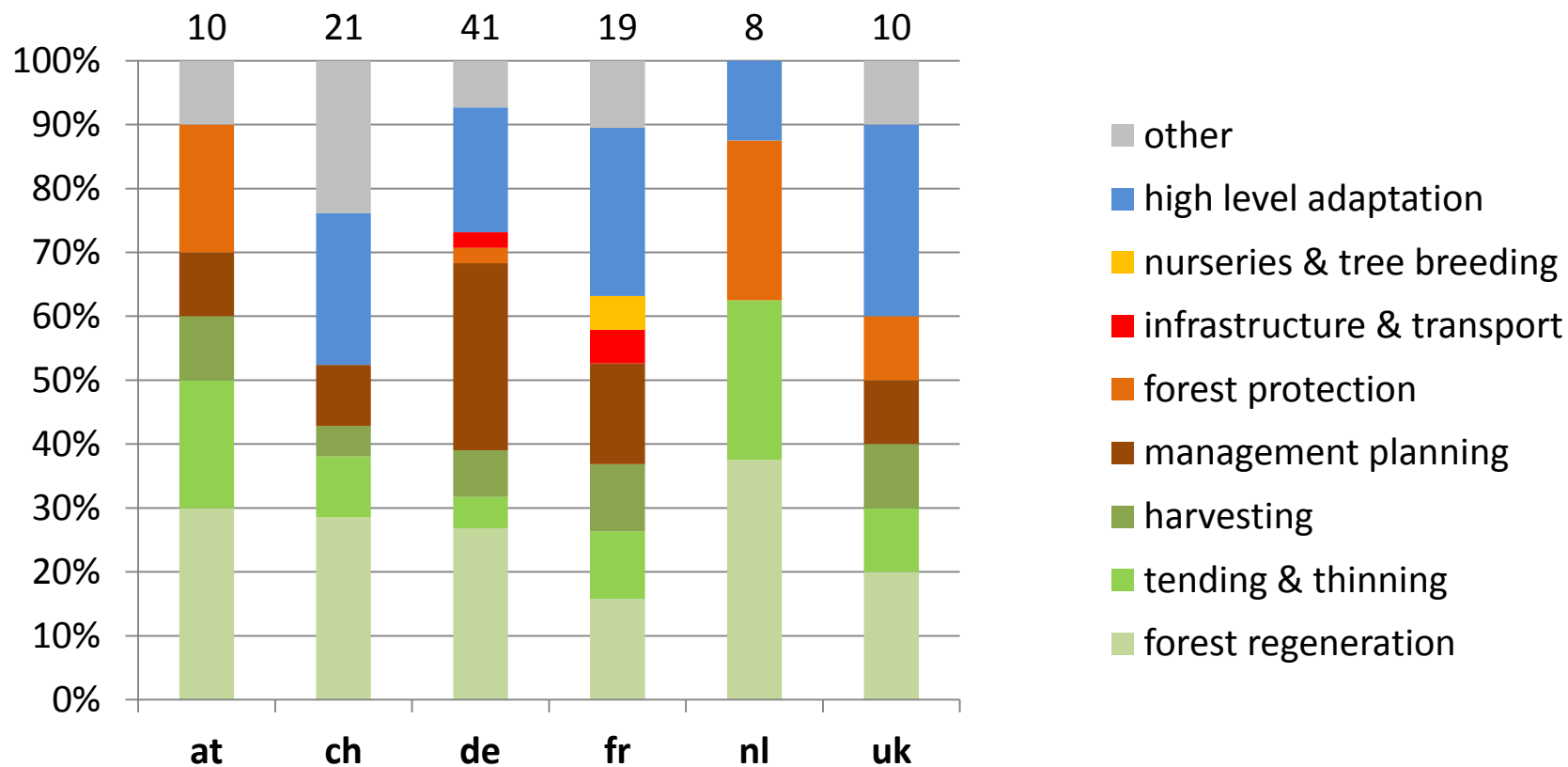
# North

➤ High variability between countries



# Central-West

➤ More similarity between countries compared to N



# Distribution of measures per EFT

| Forest type   | % of forest area | % of measures |
|---|------------------|---------------|
| 1. Boreal forest  | 25%              | 6%            |
| 2. Hemiboreal and nemoral coniferous and mixed broadleaved-coniferous forest    | 15%              | 12%           |
| 3. Alpine forest  | 5%               | 13%           |
| 4. Acidophilous oak and oak-birch forest  | 2%               | 2%            |
| 5. Mesophytic deciduous forest  | 6%               | 6%            |
| 6. Beech forest   | 3%               | 14%           |
| 7. Mountainous beech forest   | 4%               | 9%            |
| 8. Thermophilous deciduous forest   | 6%               | 3%            |
| 9. Broadleaved evergreen forest   | 6%               | 2%            |
| 10. Coniferous forests of the Mediterranean, Anatolian and Macaronesian regions | 5%               | 13%           |
| 11. Mire and swamp forest   | 6%               | 0%            |
| 12. Floodplain forest   | 1%               | 2%            |
| 13. Non-riverine alder, birch or aspen forest                                   | 5%               | 0%            |
| 14. Introduced tree species forest  | 5%               | 9%            |
| Unclassified forest   | 5%               | 10%           |



Photo North Karelia College, Valtimo



Photo Rupert Seidl

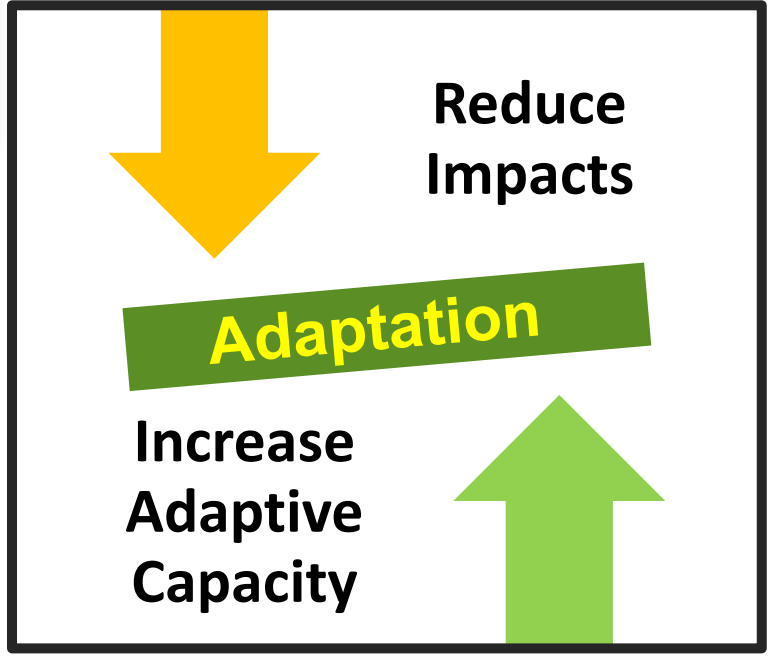


Photo: The Forestry Commission Picture Library, UK

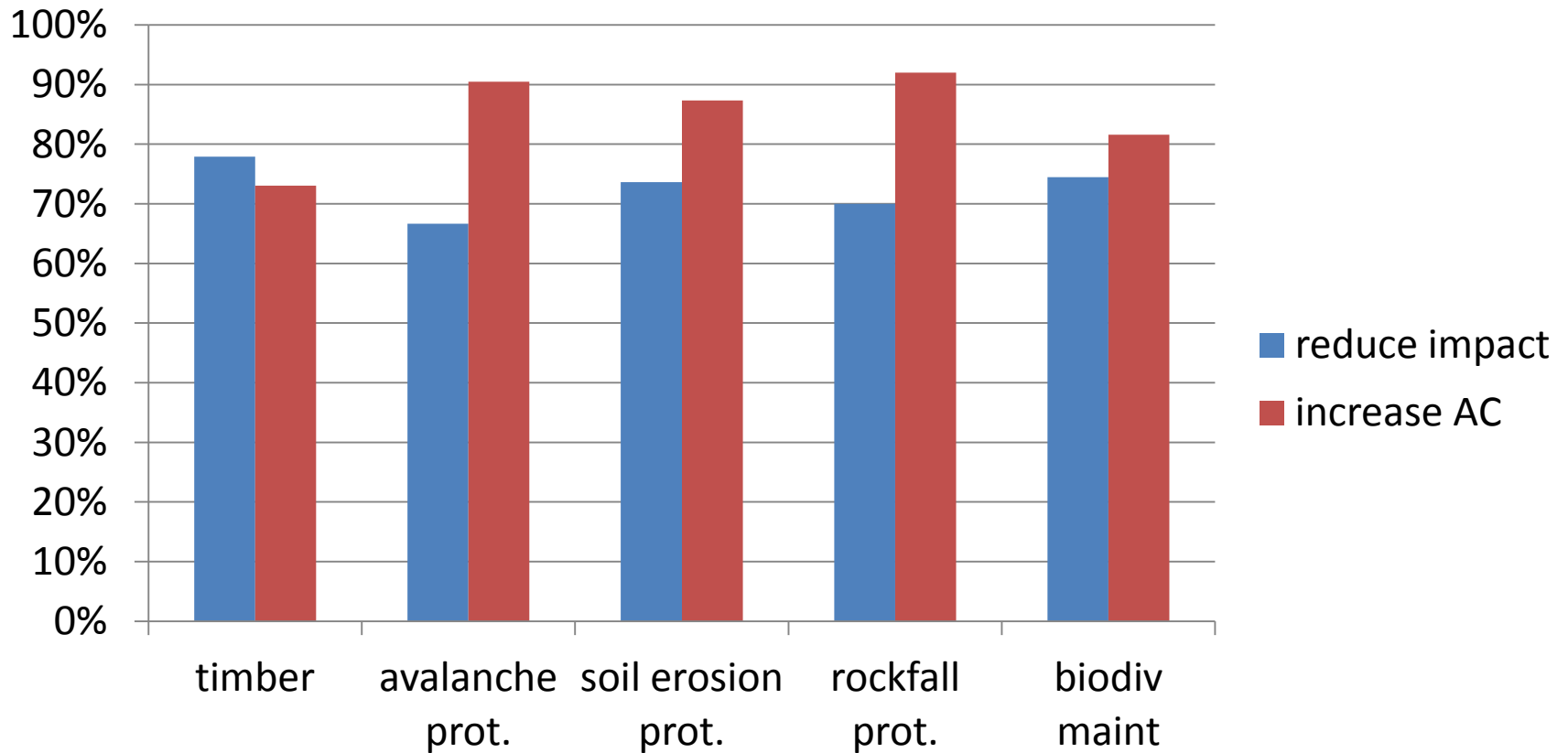


Photo: Michael den Herder

# Hypothesis

1. Management objectives (MO) determine intended impact of measures
  - More **reduce impact (RI)** measures if management is focused on timber production
  - More **increase adaptive capacity (AC)** measures if MO is biodiversity protection
2. More AC measures in proposed measures (RI measures are already ongoing)

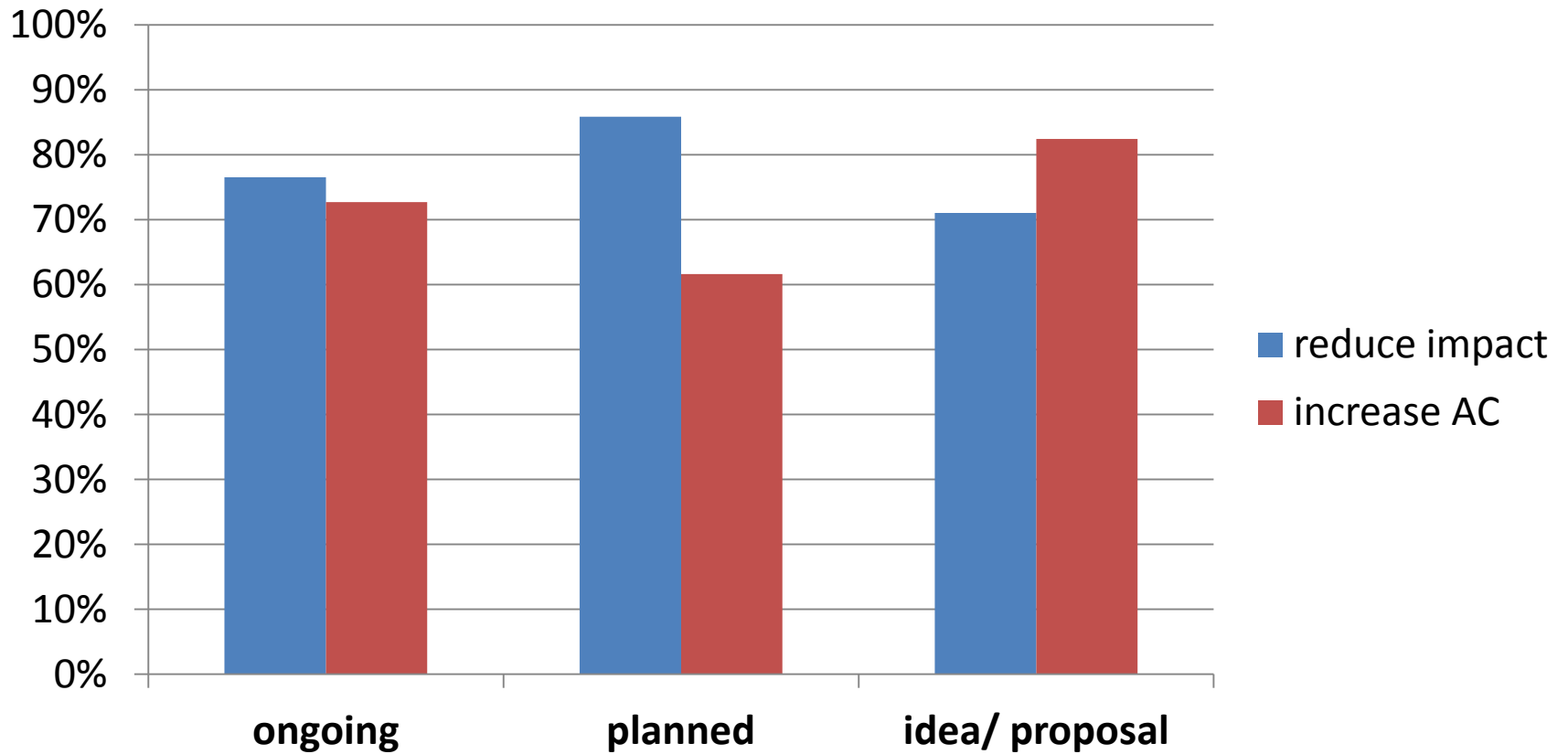
# Intended effect of measures vs management objectives



# Hypothesis

1. Management objectives (MO) determine intended impact of measures
  - More reduce impact (RI) measures if management is focused on timber production
  - More increase adaptive capacity (AC) measures if MO is biodiversity protection
2. More AC measures in proposed measures (RI measures are already ongoing)

# Status of measures vs. intended effect



## Conclusions

- There are a lot of so-called "ongoing" measures
- But not all types of measures are readily implemented
- Regional patterns in adaptation reflect different impacts and management objectives
- Increasing adaptive capacity is less common as an ongoing measure

# Conclusions

- There are a lot of so-called "ongoing" measures
  - But not all types of measures are effective
  - Regional patterns of adaptation exist
  - Increased capacity is less common as an ongoing measure
- How well prepared are we?**
- A foundation for adaptation exists – but you can still carry out more research... 😊

The ECHOES adaptive measure database will soon be made available to the wider community

**Thank you!**

*To ECHOES WG2 participants for providing the adaptive measures*

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