EUROPEAN FOREST INSTITUTE

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Assessing policy impacts on deadwood in European forests

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Introduction

- Objective:

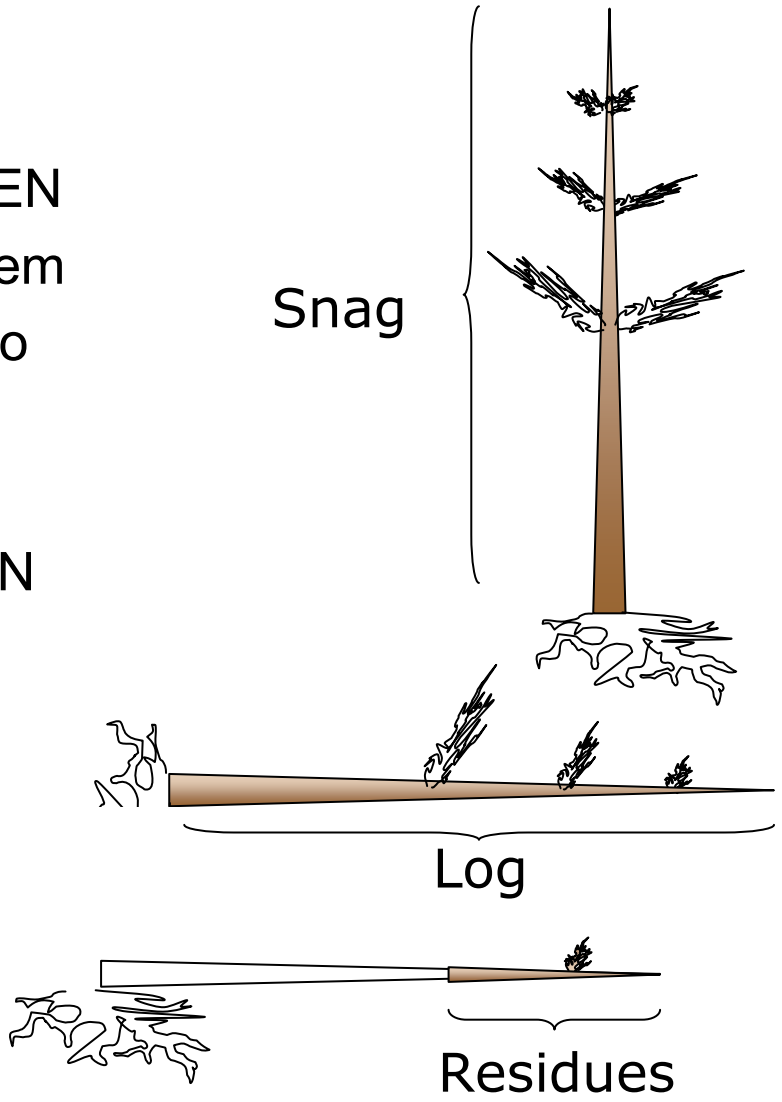
  - to develop an approach to include deadwood as an indicator for forest biodiversity in the European Forest Information SCENario model (EFISCEN)

  - analyse impacts of bio-energy production from forest biomass on deadwood quantity and quality in European forests

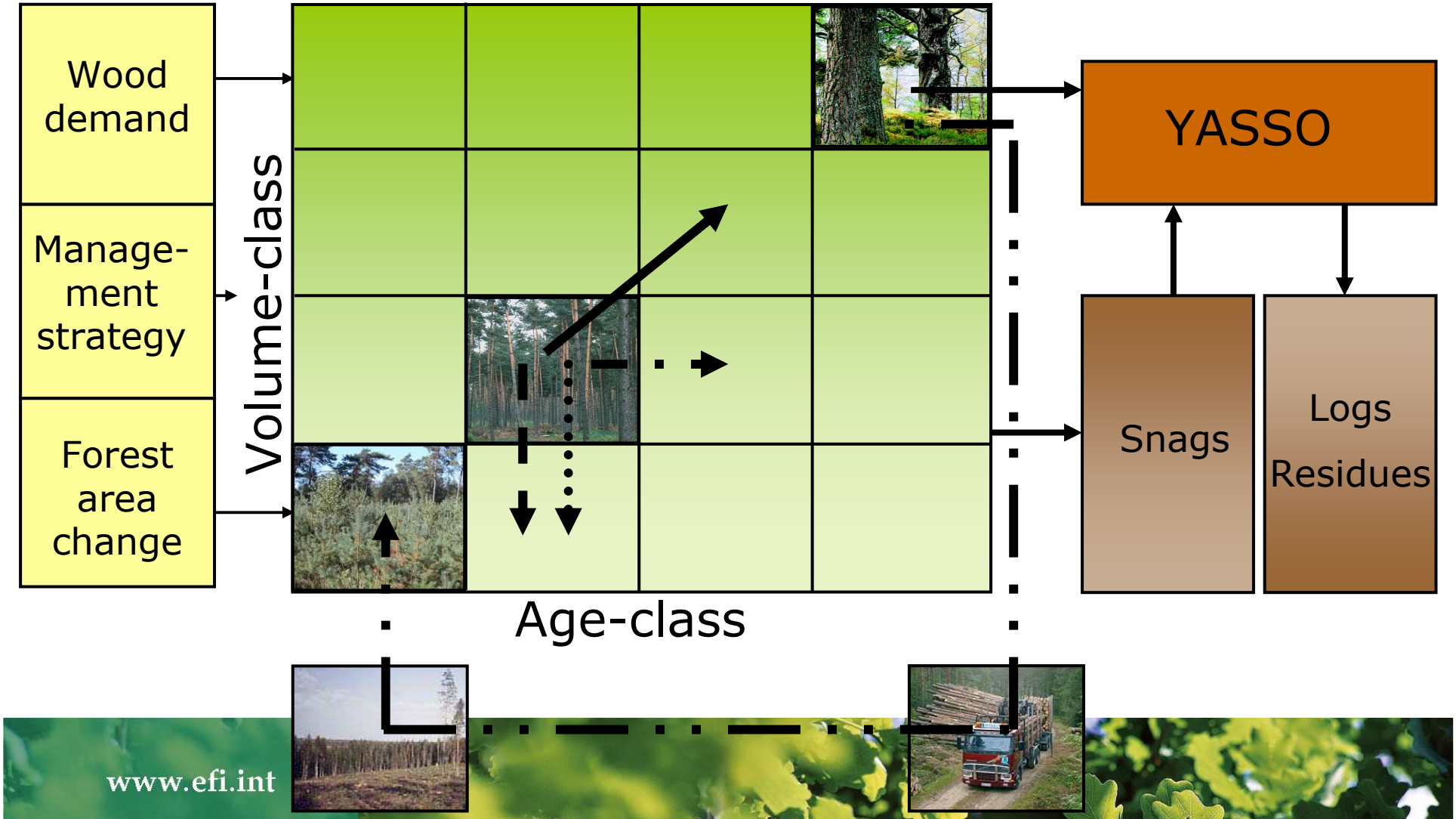
Methods

- Definition of deadwood in EFISCEN
  - Standing and lying stems or stem parts that remain in the forest to decompose

- Sources of deadwood in EFISCEN
  - Tree mortality (’natural’ death, insects, wind, etc.)
    - Snags
    - Logs
  - Forest management
    - Residues



EFISCEN modelling framework



Methods

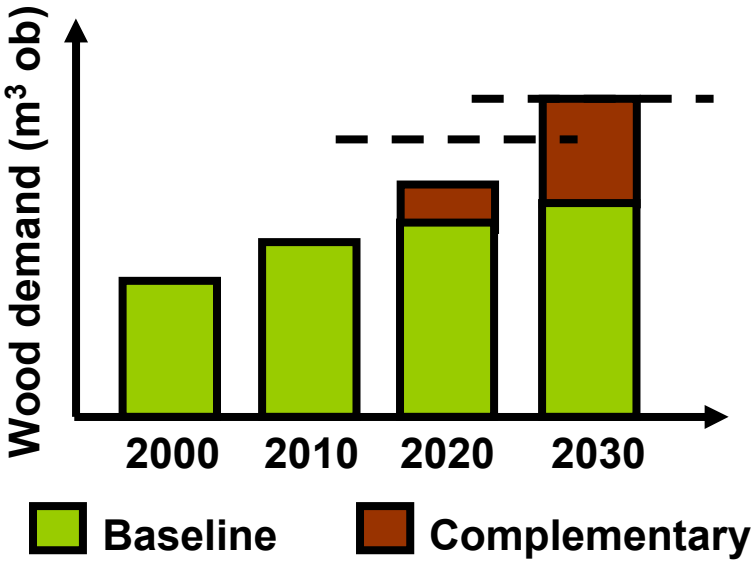
- Add mortality rates and convert net increment to gross increment
  - National forest inventory data
  - Forest inventory websites / reports
  - International databases

- Fall rates
  - Data for England, Finland, Norway, Switzerland and European Russia
  - Assumptions for other countries:
    - Conifers: $t_{0.5}$ = 15 yrs
    - Hardwood: $t_{0.5}$ = 10 yrs
    - Softwood: $t_{0.5}$ = 7 yrs
  - No decay of snags
  - Fractionation of snag

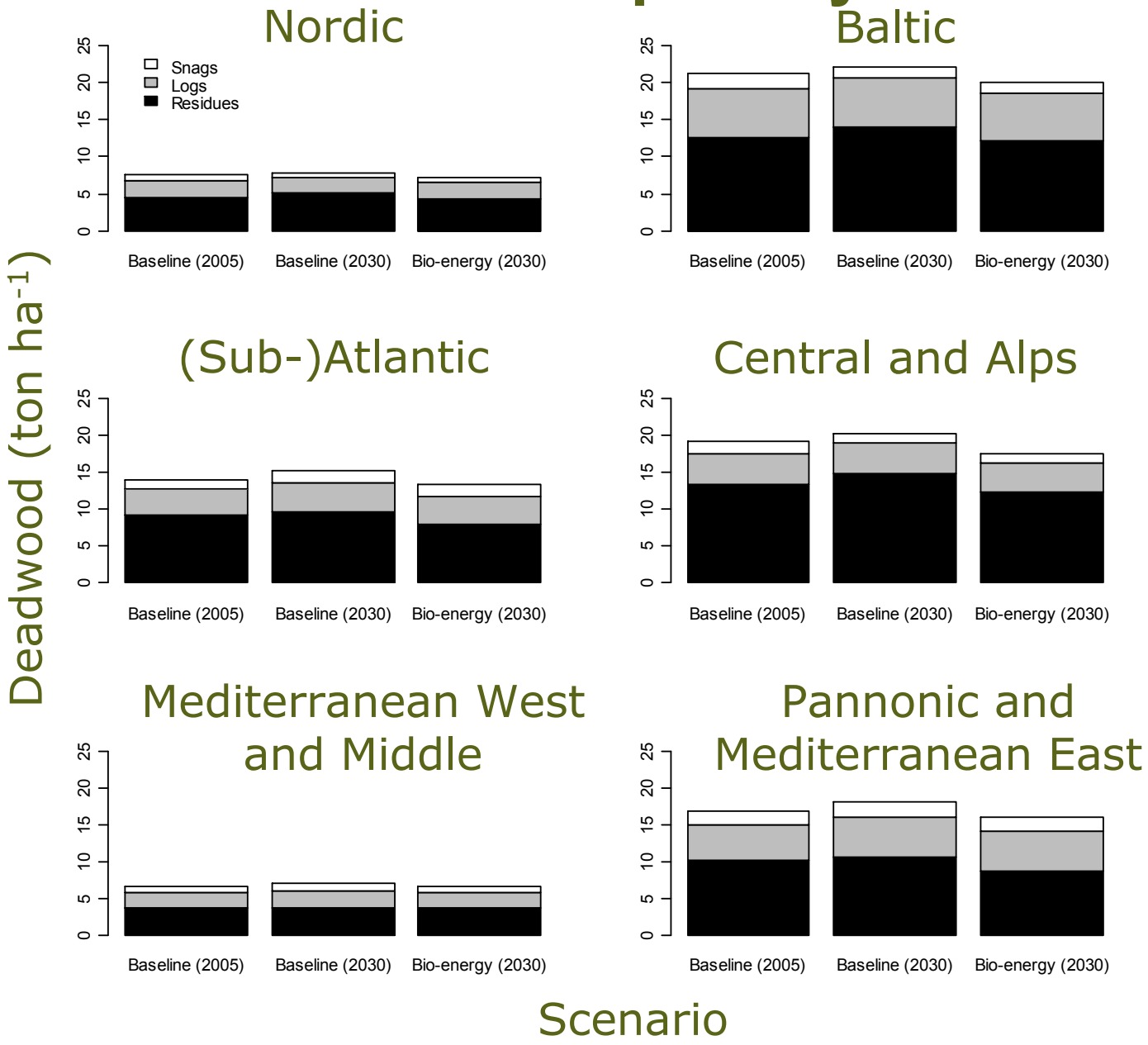
Scenarios

- Baseline: historical wood removals until 2000, EFSOS projections thereafter (Kangas and Baudin 2003)

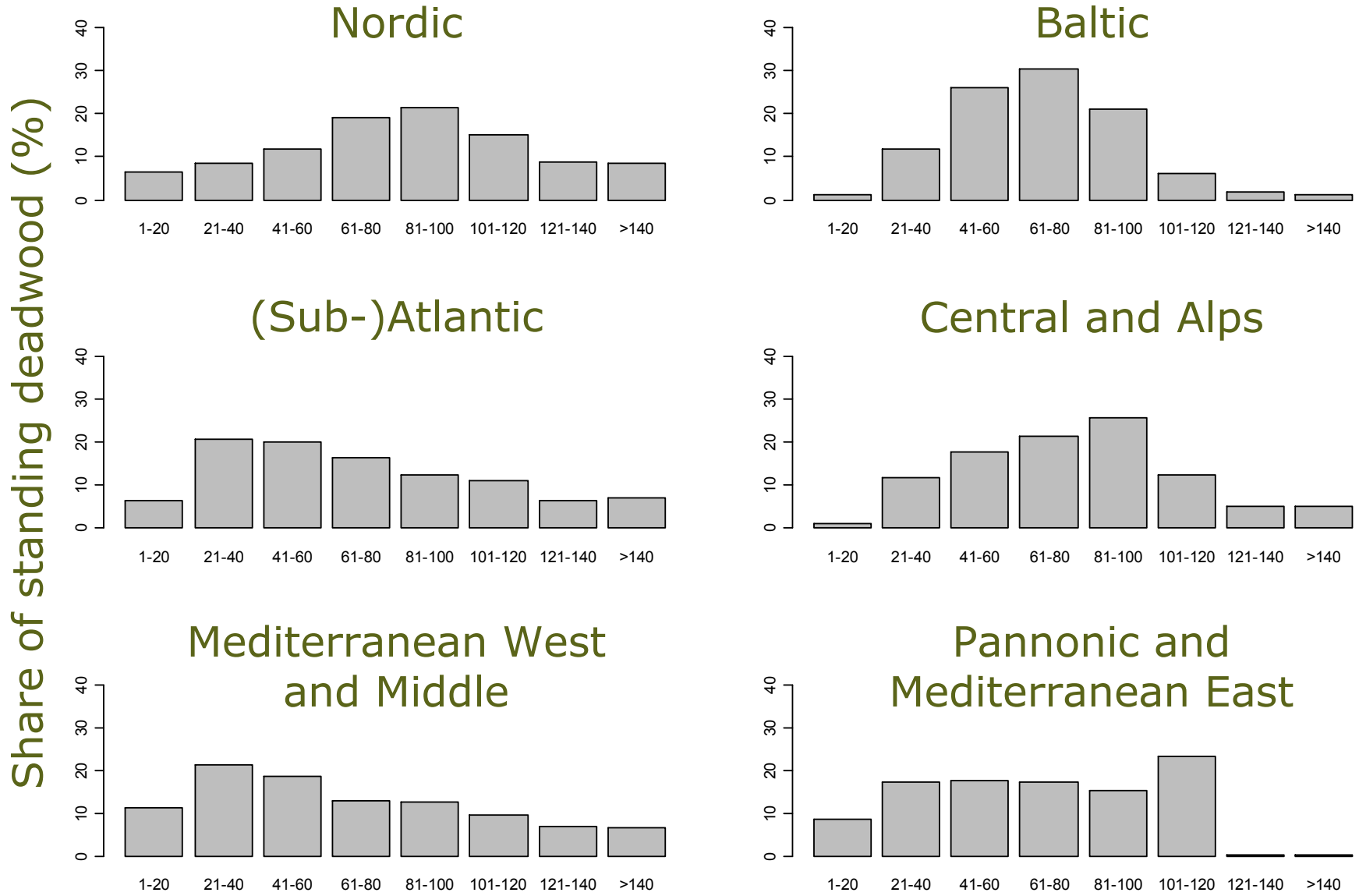
- Bio-energy: residue removal and complementary fellings after 2010 (cf. EEA 2006)



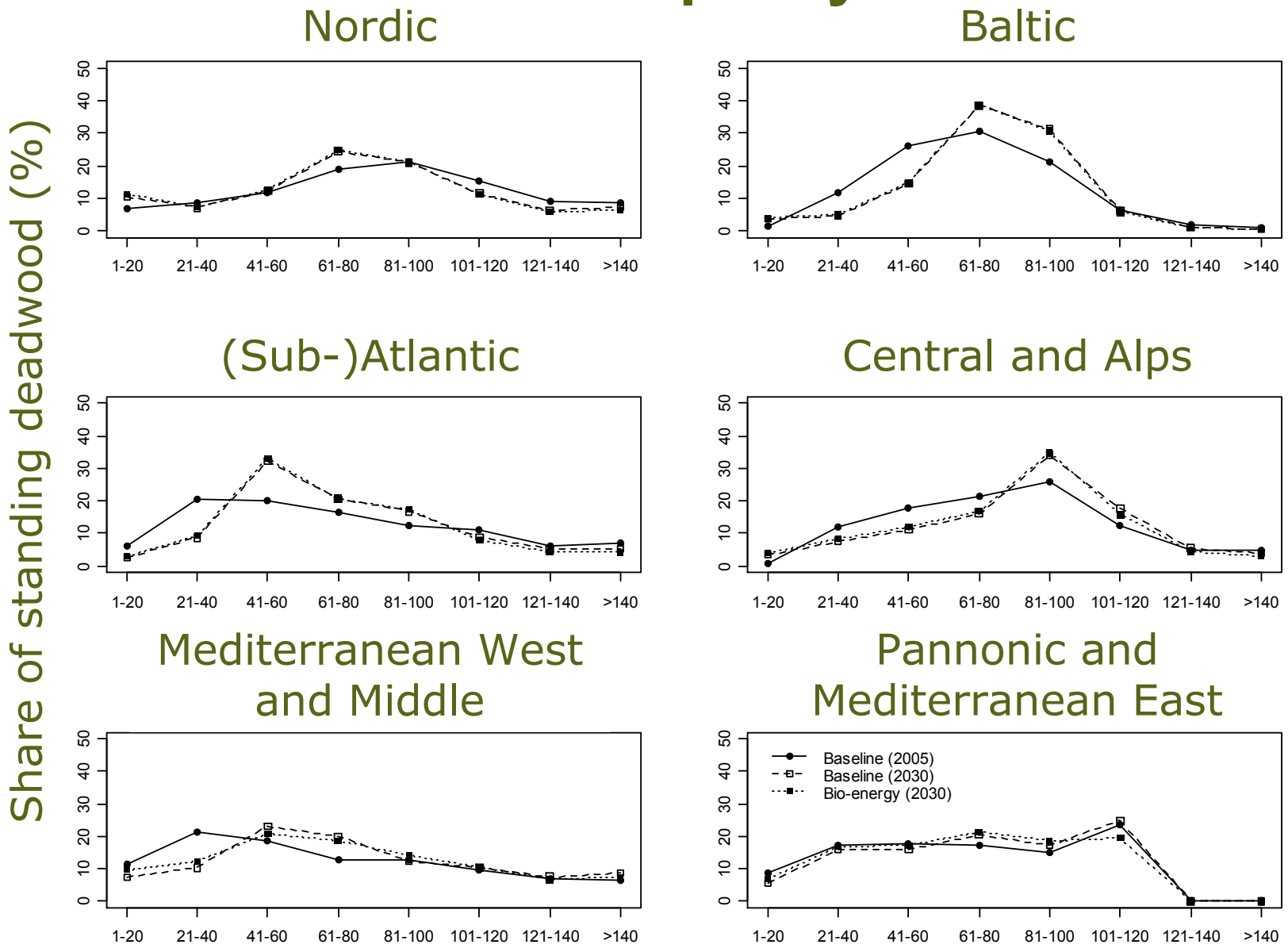
Results: deadwood quantity



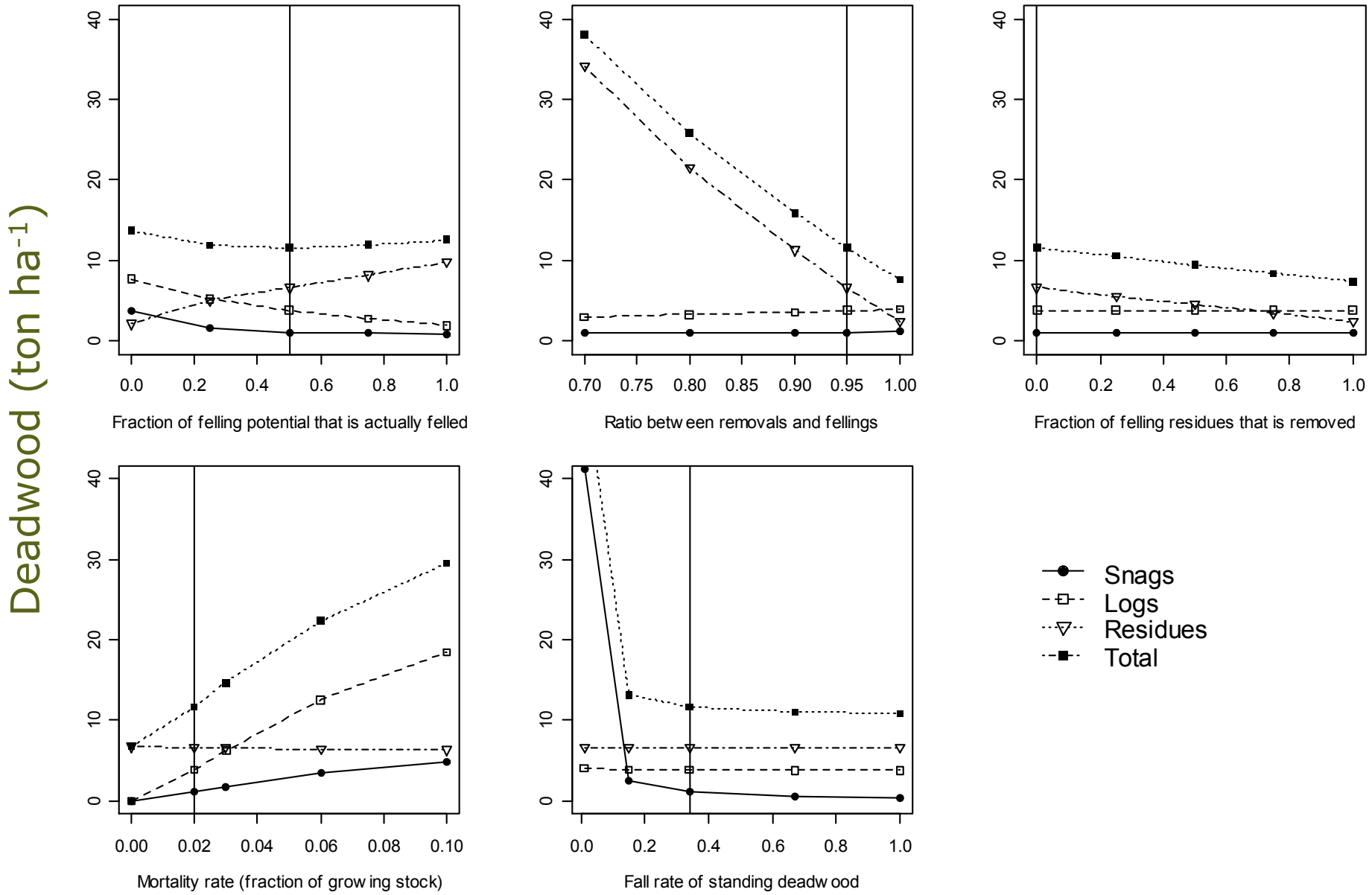
Results: deadwood quality



Results: deadwood quality



Results: sensitivity analysis



Uncertainties

- Mortality data not available for many countries
- Mortality agent affects fall rate
- No data on current fuelwood collection and forest residue removal
- Destruction of deadwood during management operations (68% destroyed according to Ranius et al. 2003)

Conclusions

- The quantity and quality of deadwood increases under baseline development and current management practices

- Increasing demand for forest biomass reduces the quantity and quality of deadwood in European forests compared to baseline

- Suggestions for forest management:
  - Create and maintain snags and logs during harvest
  - Reduce salvage fellings
  - Leave behind seed trees to die and decompose
    - But: measures reduce potential supply of forest biomass