Reporting on forest damage
Stein M. Tomter and Roman Michalak

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Introduction

• Forest damage has been reported according to different concepts in various international forest resources assessments.

• However, the harmonisation of data has often been poor, and none of the concepts for reporting have been very successful.
PAN-EUROPEAN 2011 (1)

- Forest damage reported as averages of annually affected areas (1000 ha) for the 5-year periods
  - Total area
  - Insects and diseases
  - Wildlife and grazing
  - Forest operations
  - Other human induced
  - Abiotic agents (storm, wind, snow etc.)
  - Fire (incl. no. of fires)
PAN-EUROPEAN 2011 (2)

• Major outbreaks of insects and diseases affecting forest health and vitality
  • Description / name
  • Tree species or genera affected
  • Year(s) of latest outbreak
  • Area affected
  • If cyclic, approx. cycle (years)
PAN-EUROPEAN 2015

- Forest area with damage; 1000 ha (situation in the reference year)
  - Total area with damage
  - Insects and diseases
  - Wildlife and grazing
  - Forest operations
  - Other human induced
  - Abiotic agents (storm, wind, snow etc.)
  - Fire
    - Of which human induced
  - Unspecified/mixed damage
FRA 2010 (1)

- Forest fires, reported as averages of annually burnt area for 5-year periods
- Area in 1000 ha and number of fires
  - Total land area affected by fire
    - Of which on forest
    - Of which on other wooded land
    - Of which on other land
FRA 2010 (2)

• Other damages ("disturbances"), reported as averages of annually affected areas (1000 ha) for 5-year periods
  • Disturbance by insects
  • Disturbances by diseases
  • Disturbance by other biotic agents
  • Disturbance caused by abiotic factors
  • Total area affected by disturbances
• Major outbreaks of insects and diseases affecting forest health and vitality
  • Description / name
  • Tree species or genera affected
  • Year(s) of latest outbreak
  • Area affected
  • If cyclic, approx. cycle (years)
FRA 2015 (1)

• Forest fires, reported as annually burnt area for individual years

• Area in 1000 ha and number of fires
  • Total land area affected by fire
    • Of which on forest
FRA 2015 (2)

• Major outbreaks of insects, diseases and severe weather events affecting forest health and vitality
  • Description / name
  • Year(s) of latest outbreak
  • Area damaged
General challenges to harmonised reporting of damages

- Assessment unit (sample plot, stand, damaged area, other?)
- Damage inventory methods:
  - NFI
  - Stand-wise inventory
  - Forest area treated against damaging agent
  - Dedicated monitoring
- Overlapping damages
  - How to assess damages which are present over a large area, but only affecting a smaller number of trees (like rare tree species, or individual trees on a sample plot)?
- Minimum threshold for assessing damage
- Variables used to estimate the extent of damage:
  - reduction of increment
  - reduction of future value
  - damaged growing stock
  - number of trees with observed damage
Ash dieback, caused by the fungus *Hymenoscyphus fraxineus*, is distributed over a large region of southern Norway.

At the same time, ash represents only 0.3 % of the total growing stock of the country.
Specific problems related to assessment of «existing damage»

• How long does a forest damage last?
  • As long as the damaging agent is still present?
  • Until dead or damaged trees have been removed?
  • Until the stand has been regenerated with a satisfactory density of new trees?
  • Until the new stand has grown to a similar stage of development as before the damage occurred?

• Should a change in tree species composition or other characteristics be considered a damage?
Specific problems related to assessment of «new damages during a specified period»

• How to assess damages which are still developing on the same area over more than one assessment period?
  • Example: Observation on permanent plots
    • Occasion 1: No damage
    • Occasion 2: Damage, 20% of trees
    • Occasion 3: Damage, 40% of trees
Example: Development of ash dieback over time
ICP Forests transnational Level I network:

Level I:
- 16x16 km grid (=1 plot pr. 256 km²)
- Denser national grids in some countries (e.g. Norway)
- Cross-cluster plots with 24 trees
- Countries where the NFI carries out assessments may have different plot design
- Crown condition assessments on single trees including **defoliation** and **damage causes**
- Harmonized methods for assessments, sampling and analysis according to the pan-European monitoring manual ([http://icp-forests.net/page/icp-forests-manual](http://icp-forests.net/page/icp-forests-manual))
Damage assessments in 2016:

- 24 countries
- ca 5 400 plots
- ca 100 000 trees
- more than 130 tree species

1. Symptom description
2. Identification of cause
   a. Major damaging agent groups
   b. Specific causes/species
3. Quantification (extent)

Damage symptoms according to major agent group in the main tree species and species groups in 2016.

How to improve the situation (1)?

• What questions is international reporting of forest damage supposed to answer?
  • Overall state of forest condition?
  • Effectiveness of forest protection measures?
  • Intensity of damaging factors to forests?
  • Climate change impact?
How to improve the situation (2)?

• How forest damage reporting under Indicator 2.4 need to/could/should be connected to other indicators?:
  • 2.1 Deposition and concentration of air pollutants
  • 2.2 Soil condition
  • 2.3 Defoliation
  • 2.5 Forest land degradation
  • 3.1 Increment and fellings (natural losses/removals of n.l.)
  • 4.4 Introduced tree species (invasive species)
  • 4.5 Deadwood
  • 4.7 Forest fragmentation
  • 4.8 Threatened forest species
  • 4.10 Common bird index
How to improve the situation (3)?

- Proposal: Initiate a study on assessment of forest damage at the area level, intended to improve harmonisation of data for international reporting.
Decisions to be made for 2020 pan-European reporting

• Indicator 2.4 Forest Damage:
  • Harmonization with FRA2020 definitions - to harmonize or not to harmonize (specification in a separate document)
  • Selection of a time reference for damage reporting
Selection of the time reference for damage reporting

• Option 1: area with damage present in a reporting year 1990, 2000, 2005, 2010 and 2015 (e.g. SoEF2015)

• Option 2: area with damage that occurred in individual years, and report them (?):
    • for reporting years
    • for averages, e.g. 3 or 5 year (e.g. SoEF 2007)
  • for individual years in the period 2000-2017 (e.g. FRA 2020)
Thank you!
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Stein M. Tomter
Leader of the Team
UNECE/FAO Team of Specialists on monitoring SFM
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