





Fragmented Deciduous Forest Habitats in Latvia – How Can Active Management Help?

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LATVIA – background information

- Country area = 64,000 km², forests cover 52%
- Located between nemoral and boreal forest biomes
- Dominant tree species: Scots pine (*Pinus sylvestris*), Norway spruce (*Picea abies*) and birch (*Betula spp.*); mostly mixed stands
- 50% of forests are state-owned
- Broad-leaved forests comprise ~2% (oak, ash, lime, elm, beech, hornbeam)



(c) Wikipedia



Forest pattern in 16 landscape regions

Broad-leaved forests in Latvia

- Four species were considered: Pendunculate oak (Quercus robur), European ash (Fraxinus excelsior), European lime (Tilia cordata), Elm (Ulmus spp.), European hornbeam (Carpinus betulus) and European beech (Fagus sylvatica)
- On relatively rich, well-drained soils
- Under-represented due to historical destruction through clearing of forests for agricultural lands
- Clear example: Zemgale region with mostly small patches of deciduous forest in agricultural matrix



Study methods

- Selection of forest compartments from State Forest Register using the criteria of tree species composition (>10%, >40% and >70% of standing volume) for broadleaved species, and minimum compartment size of 0.1 ha
- Analysis of composition & spatial configuration at country level and in landscape region level (16 regions)
- Identification of hotspots, mapping, visualization, statistics
- Field surveys

Age structures (area by age decade)



Oak



Ash



Lime

Spatial patterns

- Only two metrics: Patch area (ha) and ENN distance (m)
- Only stands with ≥70% of particular species
- Patch area threshold: 0.1 ha (excludes retention tree groups)



Clustered & dispersed distributions

All deciduous ≥70%, patch area distribution



Patch area (ha)

All deciduous ≥70%, patch isolation



Oak \geq 70%, patch area distribution



Patch area (ha)

Oak \geq 70%, patch isolation



Ash \geq 70%, patch area distribution



Patch area (ha)

Ash ≥70%, patch isolation



Presence of core areas (50m) in patches by count and by area

- Oak >70% = 10% w/ core areas, 0.9% of area
- Ash >70% = 20% w/ core areas, 1.6% of area
- Lime >70% = 5% w/ core areas, 0.4% of area
- Elm >70% = 3% w/ core areas, 0.2% of area
- Deciduous species combined >70% = 14% w/ core areas, 1.2% of area
- + These are patches inside forest matrix
- Egde effects from clearcuts

Management implications

- 15-20% of identified stands already have some level of protection (formally protected, WKH or EU-habitats)
- Small size and fragmentation limits their functionality as elements of habitat network and the oportunities for effective habitat management
- These findings can target management efforts on areas (regions) with habitat concentrations

Current management initiatives

- Interest in landscape ecological planning from LVM (manager of public forests)
- 'Eco-forests' (in state forests) aggregate smaller patches of valuable stands into larger areas with zoning (lower intensity or no harvesting)
- Eco-forests help to concentrate protection efforts on larger, homogenous areas



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Thank you for your attention!

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