Nature conservation and forest management in Steigerwald

by Ulrich Mergner, Ebrach
Clear-cutting is the predominant management regime worldwide

Cut and leave, Romania
(Photo: Ulrich Mergner)
Forest biodiversity lost!

Danube valley,
Romania

(Photo: Ulrich Mergner)
We urgently need examples for alternative concepts:

Timber harvesting in accordance with nature in Ebrach/Bayerische Staatsforsten
Information Forest Enterprise Ebrach:

17,000 ha total, 16,500 ha forest

Mean age: 90 years

Ancient cultural land – dense settlement

75% Broadleaves, 25% Conifers

Increment/year: 140,000 m³

Harvest/year: 103,000 m³

Sale/year: 85,000 m³

11,500 ha Natura2000 area

16,800 ha Landscape protection area

6 Mio € Turnover,
95% from timber sales

250 km enterprise borders: compact but not continuous forest area

Mean age: 90 years

Many hardwood specialized sawmills

High demand for fuel wood
Mission: To deliver demands in optimal way

**Demand:** Sawn timber
- nearly 25 Sawmills
- 50,000 m³/year

**Demand:** Fibres
- ca. 10 customers, 7000 m³/year

**Demand:** Fuel wood
- 2000 customers
- 15,000 m³/year

**Demand:** Working place
- 60 workers
- 12 contractors
- 30 Sawmills

**Demand:** Conservation
- Large beech forest area
- 11,500 ha Natura2000 areas
- NGOs demand National Park

**Demand:** Drinking water
- 600 springs, 241 ha Water protection areas

**Demand:** Recreation
- Visitors, Locals, Communities
- 125 hiking trails = 336km

**Demand:** Hunting
- ca. 60 – 70 hunters
- More than 1000 hunters during driven hunts
Targets for state forest according to Art. 18 of Bavarian Forest Law:

Management aims for state forests is to optimize the total value of all ecosystem services.
The most difficult compromise

Demand: **Conservation**
- Large beech forest area
- 11,500 ha Natura2000 areas
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Demand: **Sawn timber**
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Demand: **Fuel wood**
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Demand: **Working place**
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Forstbetrieb
Ebrach:
2300 customers
in 150 villages
Fright charges of timber from forest to sawmill
Dezentralized timber demand requires dezentralized biodiversity concepts

60 Sägewerke in der Region Steigerwald

Timber sales

Sägewerkskunden des Forstbetriebs Ebrach in der Region Steigerwald

Landkreis Bamberg
1. Brehm, Richard – Kemmern
2. Eberlein – Stadelhofen
3. Gunreben – Struendorf
4. Jacob, Erich – Grub am Forst
5. Kröner – Bischofberg
6. Lechner – Burgebrach
7. Moser – Burgwindheim
8. Noser – Burgebrach
9. Reinein – Geiselwind
10. Schonath – Scheßlitz
11. Schug – Schönbrunn
12. Ziegelhöfer – Breitengüßbach

Landkreis Schweinfurt
13. Alt – Schwedheim
14. Barthel – Donnersdorf
15. Geleitmann – Wipfeld

Landkreis Haßberge
16. Bauerschmitt – Eltmann
17. Gehrig – Oberaurach
18. Jäger, Ludwig – Rauhenebrach
19. Jäger, Bernd – Rauhenebrach
20. Reitz – Worfurt
21. Wirth – Oberschleichach
22. Zipfel – Rauhenebrach

Landkreis Erlangen-Höchstadt
23. Brehm, Wolfgang – Adelsdorf
24. Kügler – Vestenbergsreuth

Landkreis Neustadt a. d. Aisch-Bad Windsheim
25. Nahrhaft – Markt Bibart
Concept of Bavarian State Enterprise for conservation of natur and wood-species
Knowledge of scientific researches in Naturwaldreservate in Steigerwald forests:

High amount of species on small areas
Estimation of experts:

480 saproxylic beetles in Steigerwald
What saproxylic species need:

Entrance into the tree by microhabitats
European Forest Institut (EFI) provides valuable support for integrative management
Marteloskop is an important support for recognize and value different microhabitats
We forster have to change our optic — what is a beautiful tree?
We foresters had to change:
from sign to cut .....
... to the wave of habitat-tree

The reason: dead branch
Regional Concept for conservation of natur and wood-species
Strategy for the safeguarding of biodiversity
Our local concept

- Integrative model „Schützen und Nutzen“

- 1,200 ha set-asides:
  6 strict reserves
  200 „Trittstein“ habitats
  40 km edges

- 6,000 ha minimal impact in stands more than 100 y.

- Deadwood management:
  40 m³/ha from 140 years
  20 m³/ha from 100 years

- 10 habitat trees per ha
Habitat trees – the backbone for species diversity
Inventory 2010 including habitat trees

Legende
- Biotopbaum: Pilzkonsole
- Biotopbäume: Höhlenbäume
- Biotopbäume: freiliegender Holzkörper (ohne Rückenschaden)
- Forstbetrieb Ebrach
Conservation despite utilization

The biodiversity concept of Ebrach State Forest Enterprise

Tending

- **Conservation goal:** Retention of wolf trees (undesired overgrowth) Retention of mature „achievers“ as habitat trees
- **Silvicultural goal:** Diversification of mixed tree species

- **Implementation:**
  - No tending in mono-specific young stands
  - No negative selection
  - Spray-paint instead of chainsaw (Fuelwood harvest as priority)
**Conservation despite utilization**

*The biodiversity concept of Ebrach State Forest Enterprise*

**Early and late thinning phases**

- **Conservation goal:** Retention of potential habitat trees
- **Silvicultural goal:** Promotion of elite trees (tree groups)

**Implementation:**

- Limiting selected elite trees to ca 40 – 50 / ha
- Positive selection and marking with coloured tape
- Preservation of potential habitat trees
- No negative selection, no clearing out of bad quality trees
- Creating high stumps during harvester operations
Conservation despite utilization

The biodiversity concept of Ebrach State Forest Enterprise

Regeneration phase (AD / VJN / LB)

- **Conservation goal:** Accumulation of deadwood (20 m³ / 40 m³)
  10 habitat trees/ha
- **Silvicultural goal:** Target diameter harvest
  Promotion of admixtures
- **Implementation:**
  - Separation of the harvested trunk from the crown at first strong branch
  - Limiting the use of timber not processed for sale
Conservation despite utilization

The biodiversity concept of Ebrach State Forest Enterprise

General rules

• No timber harvest during the period of breeding and rearing
• Early termination of harvesting in mature and old stands
• Permanent marking of habitat trees with „wave line“
• No felling of habitat trees accidentally marked for harvesting
• Trunk sections with cavities are left in the stand when a habitat tree was felled accidentally
The cross-linked network of "Trittstein" habitats
Trittstein habitats are permanently marked
Deadwood volumes increased to 23 m³ per ha (Inventory 2010)
Nutrient sustainability
Quelle: Weis/Göttlein: Nährstoffnachhaltige Biomassenutzung, LWF-aktuell 90-2012
Deadwood
—
Mould
—
Water storage
Quelle: Integrate / European Forest Institut
Example: Black woodpecker (Dryocopus martius)
Habitatbaumfläche 10 ha

200 ha Revierfläche = 1 Brutpaar
10 ha Habitatatbaumfläche

200 ha Revierfläche

= 1 Brutpaar
200 ha

= 20 x 10 Hektar

= 20 Brutpaare
Example: Black beetle (Bolitophagus reticulatus)
Jörg Müller, 2004:
The species is not occurring in managed forests

To date, 2016:
Bolitophagus reticulatus occurs all over the forest area
Example: *Hericium* spec. (*H.Coralloides, H. erinaceus, H.cirrhatum*)

Not a rarity anymore also in the managed forest.
Celedula albicollis, Collared flycatcher

Occurs due to abundant small cavities all over the managed forest
Trox perrisii

2010 re-discovered in the managed forest
Benefits of the concept:
1. Compatibility of ecology and economy in the same forest
2. Short distance timber sales
3. Short distance wilderness experience
4. Distribution of species over total forest area
5. Applicable in nearly all forest enterprises

Preconditions:
1. Remnants of natural forest vegetation
2. Waiving of maximal income from timber sales
3. Acceptance of local population
FFH-Area: Buchenwälder und Wiesentäler des Nordsteigerwaldes
Der Forstbetrieb Ebrach im FFH-Gebiet Nordsteigerwald
Seven FFH – umbrella - species in Steigerwald

- Lucanus cervus
- Myotis bechsteinii
- Triturus cristatus
- Myotis myotis
- Bombina variegata
- Barbastella barbastellus
- Dicranum viride
<table>
<thead>
<tr>
<th>Species</th>
<th>Population</th>
<th>Habitat-Quality</th>
<th>Disturbance</th>
<th>Erhaltungszustand</th>
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<tbody>
<tr>
<td>Lucanus cervus</td>
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<td>B</td>
<td>C</td>
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Five Natura2000 - Habitats

LRT 9110 Hainsimsen-Buchenwald (Luzulo-Fagetum)

LRT 9130 Waldmeister-Buchenwald (Asperulo-Fagetum)

LRT 9170 Labkraut-Eichen-Hainbuchenwald (Galio-Carpinetum)

LRT 9180 Schlucht- und Hangmischwälder (Tilio-Acerion)

LRT 91E0 Auenwälder (mit Alnus glutinosa und Fraxinus excelsior)

## Five Natura2000 - Habitats

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<thead>
<tr>
<th></th>
<th>Luzulo Fagetum 9110</th>
<th>Asperulo Fagetum 9130</th>
<th>Tilio Acerion 9170</th>
<th>Alno-Padion 9180</th>
<th>Carpinion Betuli 91E0</th>
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<td><strong>Typical Species</strong></td>
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<td>A</td>
<td>A-</td>
<td>B+</td>
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The Ebrach concept shows:

There is no problem to combine Natura2000 (Biodiversity conservation) with timber harvesting (Timber demand)
Timber for people
Deadwood for biodiversity