



## FACTS AND FIGURES

Marco Conedera

### Definitions

Coppice - Forest grown from coppice sprouts or root shoots with a short rotation period. Oldest form of regulated forest use, mostly to obtain firewood. This management system favours tree species that can develop coppice sprouts like chestnut, beech, hornbeam, and oak. Coppice forests are regularly clear-cut (every 10–30 years).

*(German) Niederwald - Aus Stockausschlag oder Wurzelbrut hervorgegangener Wald mit kurzer Umtriebszeit. Älteste Form der geregelten Waldnutzung, vorwiegend zur Brennholzgewinnung. Die Bewirtschaftungsart begünstigt Baumarten mit der Fähigkeit zum Stockausschlag wie Edelkastanie, Buche, Hagebuche und Eiche. Niederwald wird in kurzen Zeitabständen (alle 10–30 Jahre) kahl geschlagen.*

*(Italian) Ceduo - Bosco cresciuto da polloni di ceppaia o radicali a turno breve. È la più antica forma di gestione regolamentata del bosco, finalizzata prevalentemente alla produzione di legna da ardere. Questo tipo di gestione favorisce lo sviluppo di specie arboree capaci di generare polloni, quali il castagno, il faggio, il carpino e la quercia. Il ceduo viene tagliato a raso a brevi intervalli di tempo (ogni 10–30 anni).*

*(French) Taillis - Forêt à courte rotation, issue de rejets de souche ou de drageons. C'est la plus ancienne forme d'exploitation forestière réglementée, qui sert avant tout à produire du bois de chauffage. Cette forme d'exploitation privilégie les essences pouvant donner des rejets de souche, comme le châtaignier, le hêtre, charme ou le chêne. Les taillis sont exploités à intervalles courts et réguliers (tous les 10 à 30 ans).*

### Legal Framework

Clearcuts are not allowed according to the law; exceptions can be authorised by the Kantone.

### Statistics

See table below. No data for pollarded (high) coppice and short rotation coppice (in part because they are close to non-existent).

	Simple Coppice	Coppice with Standards
Area (ha)	25,800	9,400
Percent total Swiss forest (%)	2.1 %	0.7%
Average stem density (N/ha)	622	528
Average growing stock (m <sup>3</sup> /ha)	189	267
Average growth rate (m <sup>3</sup> /ha/yr)	5.5	6.7

## Typology

<b>Simple coppice</b>	Coppicing of chestnut stands or alder stands close to the rivers (0.1 to 0.3 ha). Coppice forests in and to the north of the Swiss Alps are dominated by beech, oak, ash and alder. In the south, sweet chestnut is the main tree species.
<b>Coppice with standards</b>	This type has almost disappeared; it is only exceptionally practised in chestnut forests. Historically, there were forest stands composed of oaks from seeds (for masting) and hornbeam from coppice (for firewood) in the north of the country.
<b>Pollarding</b>	Former chestnut orchards treated as pollards starting in the late 1960s; now abandoned. Willows were pollarded and used on yearly basis for fixing the yearly growth of grapevines.
<b>Short rotation coppice</b>	Not relevant in Switzerland at the moment

## Images



Ceduo sample;  
chestnut simple coppice



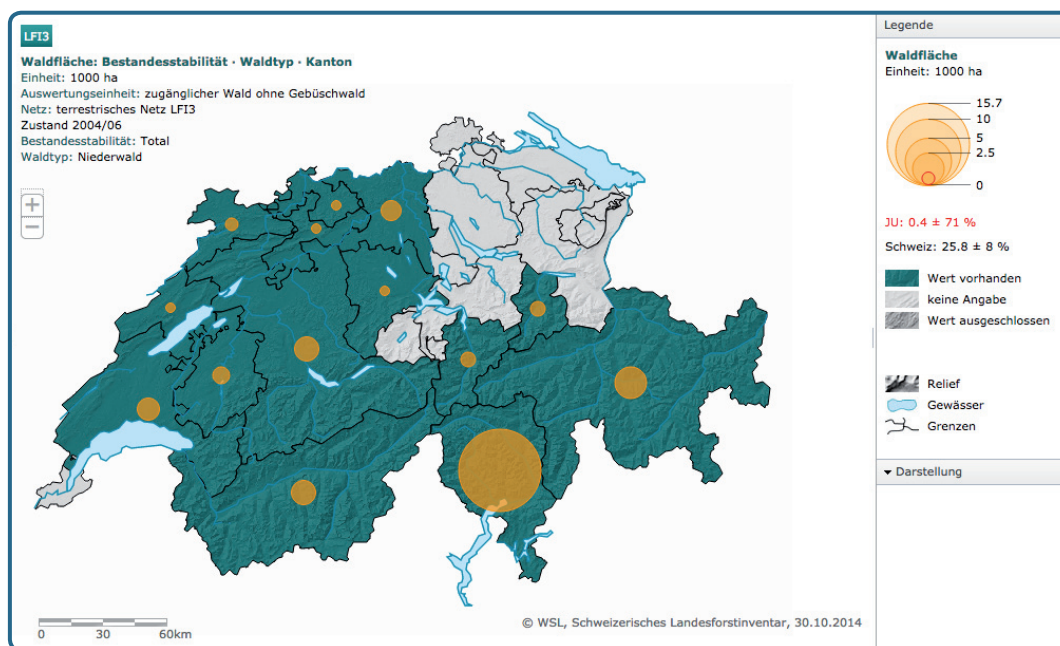
Chestnut coppice  
with standards



Pollarded former  
orchard; chestnut

## MAP

Josephine Cueni



Map of the area of simple coppice in Switzerland per Kanton in 1000 ha  
 Source: LFI3, Abegg et al. 2014.

Abegg, M.; Brändli, U.-B.; Cioldi, F.; Fischer, C.; Herold-Bonardi, A.; Huber M.; Keller, M.; Meile, R.; Rösler, E.; Speich, S.; Traub, B.; Vidondo, B., 2014: Schweizerisches Landesforstinventar - Ergebnistabelle Nr. 137279: Waldfläche Birmensdorf, Eidg. Forschungsanstalt WSL <https://doi.org/10.21258/1019053>

## DESCRIPTION

Josephine Cueni and Patrick Pyttel

As in many other European countries, coppice forests with and without standards were brought to Switzerland by the Romans around four centuries B.C. Both forest types have been characteristic elements of the Swiss landscape for centuries. Due to socio-economic changes, most coppice forests, with and without standards, were abandoned or converted into high forests during the 19<sup>th</sup> century (Schuler et al., 2000; Meier, 2007; Imesch et al., 2015).

Today, coppice forests (excluding coppice with standards) cover about 25,800 ha, which is 2.1% of the total Swiss forest area (Abegg et al., 2014). The majority of the remaining coppice forests were last harvested between 1959 and 1963. These forests currently show slow growth (ca. 5.6 m<sup>3</sup> ha<sup>-1</sup> a<sup>-1</sup>), low mean annual harvesting rates (0.5 m<sup>3</sup> ha<sup>-1</sup> a<sup>-1</sup>) and increasing dead wood volumes (ca. 1/3 of the annual increment; Abegg et al., 2014; Häfner et al., 2011). They occur in all regions of Switzerland (Jura, Midland, Pre-Alps, Alps, South), although the majority are located south of the Alps. There they make up 20% of the regional forest area (Abegg et al., 2014). Most are found on fertile sites and at elevations ranging from <600 m to 1000 m. Coppice forests in and to the north of the Swiss Alps are dominated by beech, oak, ash and alder. In southern Switzerland, sweet chestnut is the main tree species (Bachofen et al., 1988).

Due to the prevailing orography, protection is a key role of Swiss forests. Around 16.900 ha or 66% of all coppice forests in Switzerland are located in the area of protection forests. Of the coppice forests in the Alps and in southern Switzerland, 71% and 86% serve as protection forests, respectively (Abegg et al., 2014). This management type is only thought to be suitable

for this function under certain circumstances, i.e. when slopes are short (<75 m), and rocks likely to fall are less than 40 cms diameter (Frehner et al., 2005; Gerber and Elsner, 1998). Consequently, coppicing is not suitable in the majority of protection forests and (the naturally occurring) conversion of coppice stands into high forest is welcomed (Frehner et al., 2005).

Since 1991, the Swiss Government has offered monetary incentives for the supply and use of fuel wood (BUWAL, 2005). Within this context, the resumption of coppicing and the need for short rotation plantations has been the subject of controversy (Schmidt et al., 2008; Zimmermann, 2010). Generally, coppice forests and short rotation plantations are not considered important for fuel wood since regional demand can be satisfied by day-to-day forest management and because of concerns regarding landscape aesthetics (Oettli et al., 2004; Meier, 2007; Ansprach and Roesch, 2014). The Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) has investigated the economic potential of chestnut coppice forests for valuable wood production (e.g. Zingg and Giudici, 2006) and there are some innovative enterprises that are trying to market assorted products from over-aged coppice forests (Castagnostyle 2015, online).

The Swiss Ministry of Environment (BAFU) considers coppice forests (with and without standards) as valuable forest types important for biodiversity, culture and history. The Ministry promotes the preservation of these by paying subsidies for restoration and tending of coppice forest with and without standards (4000 CHF ha<sup>-1</sup> per intervention; Imesch et al., 2015; BAFU, 2011). Between 2004/06 and 2009/13 re-coppicing occurred on 400 ha

(Abegg et al., 2014). To date between 600 and 700 ha of simple coppice and 400 to 800 ha of coppice with standards were designated parts of forest reserves (WSL, 2015). It can be assumed that these forests are being -or will be- managed traditionally (WSL, 2015). Some of them also serve as study sites for the WSL (e.g. Rothenfluh BL; WSL, online).

To conclude, few previously coppiced forests in Switzerland continue to be managed in this way. The exceptions are some study sites and parts of some forest reserves. The unsuitability of coppice for protection forest and the production of enough fuel wood as a byproduct of day-to-day forest management do not encourage the continuation of this ancient management system. There is probably more managed coppice, both simple and with standards, in the

context of nature conservation and the preservation of cultural historical landscapes than for economic reasons. It is possible that increasing fuel wood prices will encourage more coppicing in the future.



Figure 1. Aged coppice forest on steep slopes in the Untersiggenthal, canton of Aargau (Photos: Pro Natura, Christoph Oeschger)

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## FORESTRY REGULATIONS

Jenny Mills, Peter Buckley, Josephine Cueni and Patrick Pyttel

A third of Swiss territory is forested, but coppice and coppice-with-standards now covers only small areas. However, the guidelines issued by the Swiss Federation BAFU in 2015 concerning biodiversity in forests indicates that there are noteworthy remnants of coppice-with-standards in the cantons of Baselland, Aargau, Zurich, Schaffhausen and Thurgau, where projects are taking place to boost coppice-with-standards management. Areas of relict coppice are located mainly in the canton of Fribourg, along the River Sarine, in the canton of Vaud along the foot of the Jura, in the canton of Bern along the Old Aar river, in the Grisons, and in the Rhine

valley around Chur. The guidelines suggest that traditional coppice management to increase biodiversity could be reintroduced in a sustainable way in former coppice stands or be newly established in other places.

At the national level, the Swiss Confederation has passed a **Federal Act on Forest** and a **Forest Ordinance**, among other laws that relate to the environment. The aims of the Federal Act are to conserve the forest area and its spatial distribution; to protect the forest as a near-natural community, to ensure that the forest can fulfil its functions and to promote and maintain the forestry sector. One particularly vital forest

function in Switzerland is the protection of human life and important material assets against avalanches, landslides, erosion and rockfall.

The **26 cantons which make up the Federation define plans and enact regulations** taking into account the forest functions, the requirements of wood supply, near-natural silviculture and respecting the federal law for nature protection and cultural heritage. They also have to take into account the **Swiss Biodiversity Strategy**, which was adopted in 2012 by the Federation.

Each canton therefore has its own forest law in compliance with the Federal Forest Law and the Forest Ordinance and, while also respecting other environmental laws and guidance, makes cantonal forestry plans, forestry development plans and maintains a forestry service. For ecological or landscape reasons, forest management does not always have to be carried out, but where the forest serves a protective function, the cantons must ensure a minimum level of management. Forest owners (corporations, private owners, political communes, cantons) must carry this out and in return they receive federal and cantonal subsidies.

Silvicultural measures are defined as all maintenance interventions that contribute to the conservation or restoration of the stability and quality of a stand. Measures to be carried out as

part of young forest maintenance include maintaining regrowth in selection forests, in other multi-layered forests, in coppice-with-standards and coppice forests, as well as in multi-layered forest margins; protective measures against damage caused by game; and path creation in areas difficult to access. Thinning and regeneration measures are slash removal and creation of new stands with the necessary accompanying measures, wood harvesting and transport. For protective forests, interventions are restricted to ensuring the long-term stability of the stand; felled wood is used locally to improve the protection function or left on site, as long as it does not pose a risk.

Deforestation is prohibited but, exceptionally, permits may be issued by the Federal or cantonal authorities with reference to the Federal Office for the Environment (FOEN/BAFU/OFEV/UFAM) where necessary. Compensation in kind must usually be made for any deforestation but can also lead to revaluation measures in other ecosystems.

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