

Study visit of students of Faculty of Natural Resources Management Wood Science and Forest Products Lakehead University – Ontario (CA)

Ref. Prof. Mathew Leicht

FORESTE CASENTINESI FIELD EXCURSION 31TH AUGUST 2023

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1 Casentino's Valley

1.1 Brief historic info

The Casentino is one of the four valleys of the province of Arezzo and it is located in eastern Tuscany Region. To the east, it has a natural border consisting of the Apennine ridge beyond which we find the Romagna Region. To the north, besides the Falterona Mount (1654 m s.l.m.), we find the Mugello Valley in the province of Florence. The Casentino is the first land where the Arno flows. This river has its spring, also mentioned by Dante, on the Falterona Mount at 1370 meters of height. Dante Alighieri mentions several times this valley and its places in his Divine Comedy. This is due to the fact that the Supreme Poet spent part of his exile from Florence here as a guest of Counts Guidi Castle in Poppi (visible along the journey). They were the noble and powerful family who was the absolute owner of the upper part of the Casentino from the beginning of the 11th century to half of the 14th century.

From the historic and architectural points of view, this is the period in which the evidences that have made the Casentino well-known in our days were left. Important abbeys were built (starting from the second half of the 10th century), but nowadays only one is left as such: it is the Abbey of Camaldoli, worldwide famous. Many castles and fortified centers were built. They were used as both residences of noble landowners and controlling and defensive points over the territory. The renowned ones we can visit nowadays are: the Castle of Romena, which was the first one being built, the Castle of Porciano and the Castle of Poppi, which is the most recent one and it still arises in its mighty original structure. There are beautiful Romanesque churches dating back to the 12th century that we can still admire in our days. Among these, the Church of Romena, which is a National Monument, is the most charming and famous one. In the Casentino there is another worldwide renowned place where the devotional aspect is combined with the natural, architectural and artistic ones in a way that is beyond words: it is La Verna. That is "the savage rock 'tween the Tiber and the Arno" (Divine Comedy, Paradise, XI Canto) where, in 1224, Saint Francis received the "ultimate seal": the Stigmata. Located as a spur on the Apennine ridge, the savage Verna Mount looks like a guardian over the whole valley. The Casentino is a place of great interest from also the artistic point of view. Even though there are

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no works of very well-known painters, we can find their disciples' paintings. Churches are quite always the depositories of these artistic treasures that date back from the end of the 13th century to the 18th century.

The Casentino is also famous from the archaeological point of view. There have been many findings regarding the Etruscan and Roman periods, and they are kept inside the interesting Archaeological Museum of Bibbiena. Moreover, there are two important Etruscan sites that can be visited at any time: the Church of Socana with its great and magnificent sacrificial altar of the 5th century BC; the “Lago degli Idoli”, located on the Falterona mount, which used to be a place of devotion for that population. All the above is "nestled" in a wonderful forest environment.

Even if mentioned as last, the environment definitely is the crown-jewel of the Casentino. At the bottom of the valley the agricultural crops are predominant, while the two sides, the Apennine ridge and the Pratomagno massif, are covered by various types of forests. On the left one, we find the Parco Nazionale delle Foreste Casentinesi, Monte Falterona e Campigna, with its healthy and vigorous fir (*Abies alba*) and beech (*Fagus sylvatica*) forest. Here, it is possible to go on relaxing walks or challenging excursions that can offer nice moments as: bumping into wild animals, collecting mushrooms and truffles, seeing monumental trees and enjoying the view of breathtaking landscapes. Here are also located the two important spiritual centers above mentioned: Camaldoli and La Verna. On the other side there is Pratomagno, a unique mountain for its twenty kilometres of uninterrupted grassy ridge that goes from 1300 meters of height to almost 1600.

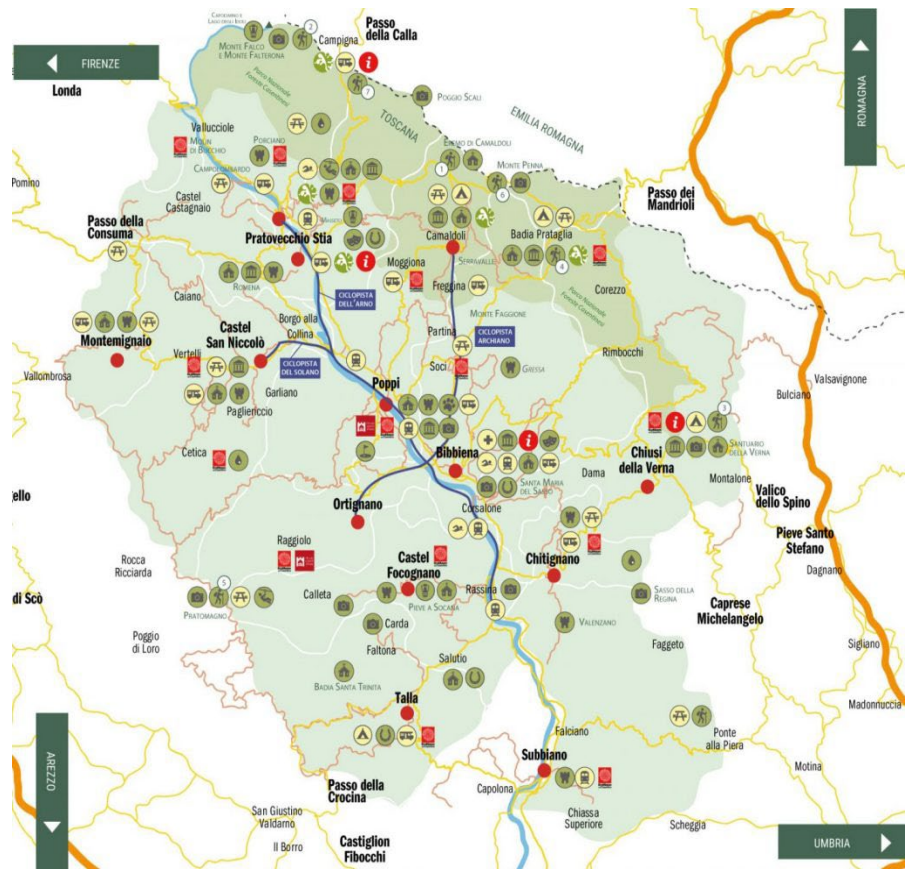
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Figure 1: Casentino's Valley

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2 The Parco Nazionale delle Foreste Casentinesi, Monte Falterona e Campigna

The National Park, covers an area of about 36,000 ha, shared between Emilia Romagna and Toscana Regions, including the provinces of Forlì-Cesena, Arezzo, and Florence. It extends along the Appennino Tosco-romagnolo ridge, descending steeply along the parallel valleys of the Romagna side and more gradually in the Toscana side, which presents itself with softer slopes, up to the wide valley bottom formed by the Arno.

The Park's landscape is characterized by sedimentary rocks, mainly sandstone interspersed with



Figure 2: The protected area "The National Park of the Casentino Forests, Monte Falterona, Campigna"

marls, more frequent in Romagna and with characteristic stratified slopes or bare ridges. The conformation in the south-east area of the Park is different, where the Monte della Verna, with its

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calcareous cliffs, stands out in a landscape with wide rounded slopes interrupted by crevice erosions, which reveal the presence of clay. The Park excels, from the naturalistic point of view, as one of the most prized forest areas in Europe, whose heart is composed of the Casentino State Property Forests, inside which is the Integral Nature Reserve of Sasso Fratino, the first Integral Reserve established in Italy in 1959, is the largest site among those designated in Italy, and one of the largest forest complexes in Europe. Also, the ancient beech forests of the National Park and the Sasso Fratino Integral Reserve have become part of the UNESCO World Heritage list. As is known, access to Sasso Fratino is forbidden, while the surrounding area, also including stretches of ancient forests of considerable value and extension and also subject to UNESCO recognition, is accessible via the trail network of the National Park.

Ancient firs (*Abies alba*), beech (*Fagus sylvatica*) forests and mountain maple (*Acer pseudoplatanus*), mixed woods with incredible variations of species that in Autumn create colourful spots of shade: beeches (*Fagus sylvatica*), maples (*Acer sp.*), ash trees (*Fraxinus sp.*), elms (*Ulmus sp.*), limes (*Tilia sp.*) and rare yew (*Taxus baccata L.*) and holly (*Ilex aquifolium L.*). In addition to the vegetation of the mountain belt, we also find all types of woods in the sub-mountain belt to be well represented: hornbeam forests dominated by the black Carpino (*Ostrya carpinifolia*), woods of oaks (*Quercus sp.*), Chestnut (*Castanea sativa*) woods (especially in the area of Camaldoli and Castagno d'Andrea in the Florentine side), reforestation of black pine (*Pinus nigra*) and partly of Douglas fir (*Pseudotsuga menziesii*).

But the flora is mainly constituted by herbaceous species: over 1000 are recorded so far, only 48 of which are trees and shrubs. The most precious population is found in the M.Falco-Falterona massif. The memory of thousands of years of natural evolution has been preserved in the meadows, the clearings, and above all in the cliffs and grassy ledges of this mountain.

The "Siemoni" Arboretum in Badia Prataglia and the Botanical Garden of Valbonella in Corniolo are the privileged places to get to know and study the flora of the Park. The Siemoni Arboretum was founded in the 18th Century as a Park-Garden where the famous forest engineer Carlo Siemoni, called by the Grand Duke of Tuscany to improve the fortunes of the Forest, planted and acclimatized various exotic species of trees, while the Botanical Garden collects the main vegetation environments of the

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Appennino Tosco-Romagnolo, with over 400 species provided with relative tags and organized in three thematic itineraries.

The National Park fauna includes the most important wolf population of the northern Apennines, as well as the exceptional presence of five species of ungulates: wild boar (*Sus scrofa L.*), roe deer (*Capreolus capreolus*), fallow deer (*Dama dama L.*), red deer (*Cervus elaphus*) and mouflon (*Ovis aries musimon*). The Park includes an area where mankind has always lived and worked, and this is the reason for the presence of many ruins and villages abandoned in its territory. Due to the massive exodus that took place after the Second World War, the number of current inhabitants of the Park is reduced to about 1,500 people.

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3 Casentino Forests

The Casentinesi Forests have a history closely linked to the monastic community of Camaldoli which begins in the 12th century (see Annex 1). They were the monks of this order who began to treat them and make them productive by planting fir (*Abies alba*) trees. Already in the fourteenth century these plants were stored in two ports along the river Arno in Pratovecchio and Poppi during the summer. When in autumn the waters of the river began to swell, the fir (*Abies alba*) trees began their journey towards Florence. The long trunks were used for the beams of the cathedral (Cupola of Brunelleschi) and other churches. Other fir (*Abies alba*) trees continued their journey to Pisa where they were used for the masts of ships in the shipyards of this seafaring city or reached other cities to be generally used for the same purpose (eg. British Navy).

Blessed Paolo Giustiniani, in 1520, had the rules of the Eremitic life reproduced in the typography of the monastery of Camaldoli, in which the wise methods of forest management created by the monks over centuries of experience are widely described. Mainly it was a question of limiting the cuts to the needs of the monks only, of establishing the earnings of possible sales to forest developments, of planting at least 4 or 5,000 fir (*Abies alba*) trees every year. These rules, of great progress and still current, allowed the monks to exploit the forests for centuries, ensuring their continuous renewal.

The 17th and 18th centuries were a period of excessive exploitation of the forests, from which a large part of the timber traded in Tuscany at the time was obtained, not only exported to Genoa and France. In 1838 the Grand Duke then entrusted the safeguarding of his forests to the forestry inspector Karl Simon of Bohemian origin, who moved to Pratovecchio directing a wise administration of Central European origin, which continued for almost fifty years and led to the rebirth of the forest cover. New cultivation rules were tested, degraded areas reclaimed, extensive plantations, including experimental ones, were started and in 1840 the first reintroduction of the deer was made. In 1866, with the decree of abolition of religious orders, the forests of Camaldoli, after eight centuries of administration by the monks, became the property of the Kingdom of Italy, and were given first to the Ministry of Finance and then to the Ministry of Agriculture and Forestry.

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In 1914, fortunately, the woods on the Romagna side were bought by the state and went to model, together with those of the Camaldoli forest domain, the Casentinesi state forests. The only tragic parentheses were the two world wars, in which the forests were destroyed for wood exploitation. After the war, emigration, which had already begun at the end of the nineteenth century, took such a rhythm as to lead to depopulation: sharecroppers and entire families left to go and look for work in the city, so much so that the villages, which in the sixties were reached by roads paved, remained inhabited only by the elderly.

In the sixties, the abandonment of mountain cultivations allowed the reforestation actions carried out by the states to recolonize the areas once cultivated

At the beginning of 1972, a large part of the forests was transferred to the regional administrations. Finally, on 14 December 1990, under the impulse of environmentalist associations and the scientific world, the national park was founded, containing almost all of the regional park of the Romagna ridge and large territories in Tuscany. Thereafter, the forest management of the Casentino Forests has moved towards a more sustainable approach that respects more environment and biodiversity.

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4 Forestry's services of Unione dei Comuni Montani del Casentino

The Unione dei Comuni Montani del Casentino has been managing the regionally owned forests located in Casentino's Valley (and partly within the National Park) for a total of 11.629 hectares.

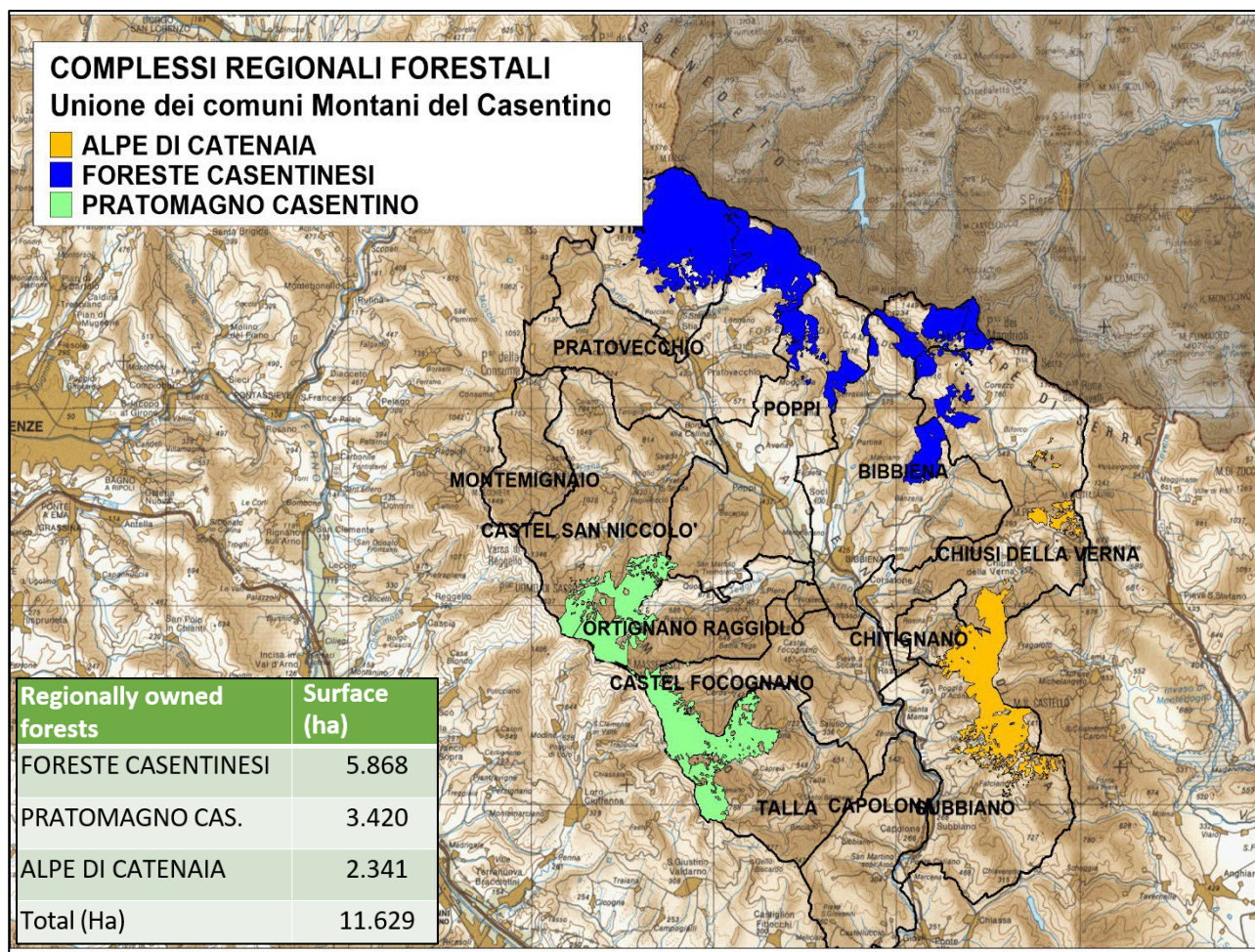


Figure 3: regionally owned forests managed by Unione dei Comuni Montani del Casentino

This forest claims a series of naturalistic, historical, cultural aspects linked to wood production. They are recognized by the Unione dei Comuni Montani del Casentino and decided to start the process to

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certify the Sustainable Forest Management according to the PEFC standard (Programme for Endorsement of Forest Certification scheme).

The regionally owned forest, currently managed by Unione dei Comuni Montani del Casentino, was established in 1977, with the transfer to the Tuscany Region part of the Camaldoli, Badia Prataglia and Campigna's Forests (with the 1980 - 1989 Management Plan the three forests are aggregated into a single complex) for a total of 4,727 hectares. With the 1994-2003 Management's Plan the planned area becomes 5,384.85 hectares due to the purchase of the Ex Vita-Meyer (427 ha) and the Frassineta section (228.55 ha), which until then was part of the "Alpe di Catenaia" forest complex. The 2008-2017 Management Plan records a further increase in surface area due to the annexation to the complex of the Ex-Giona's farm (436.7 ha) and also to the purchase of some parcels located in the Municipality of Stia (approx. 3 hectares in Prato Fantoni and Masseto).

The current 5867 hectares of the "Foreste Casentinesi" Regional Forest Complex fall for 90% in the National Park and in five Natura 2000 sites:

- Riserva Naturale Biogenetica di Campigna (Emilia Romagna)
- Riserva Naturale Integrale di Sasso Fratino (Emilia Romagna)
- Riserva Integrale della Pietra (Tuscany)
- Riserva Naturale Biogenetica della Scodella (Tuscany)
- Riserva Naturale Biogenetica di Camaldoli (Tuscany)
- Riserva Naturale Biogenetica di Badia Prataglia-Lama (Tuscany and Emilia Romagna).

The Casentinesi Nature Reserves, state owned, are managed by the Carabinieri Forestali-Biodiversity Department of Pratovecchio (4539 hectares of biogenetic reserves and 764 of integral reserve).

All these state and regional public properties form a combined area between the Apennine ridge, which give the Foreste Casentinesi name's and represent the heart of the National Park.

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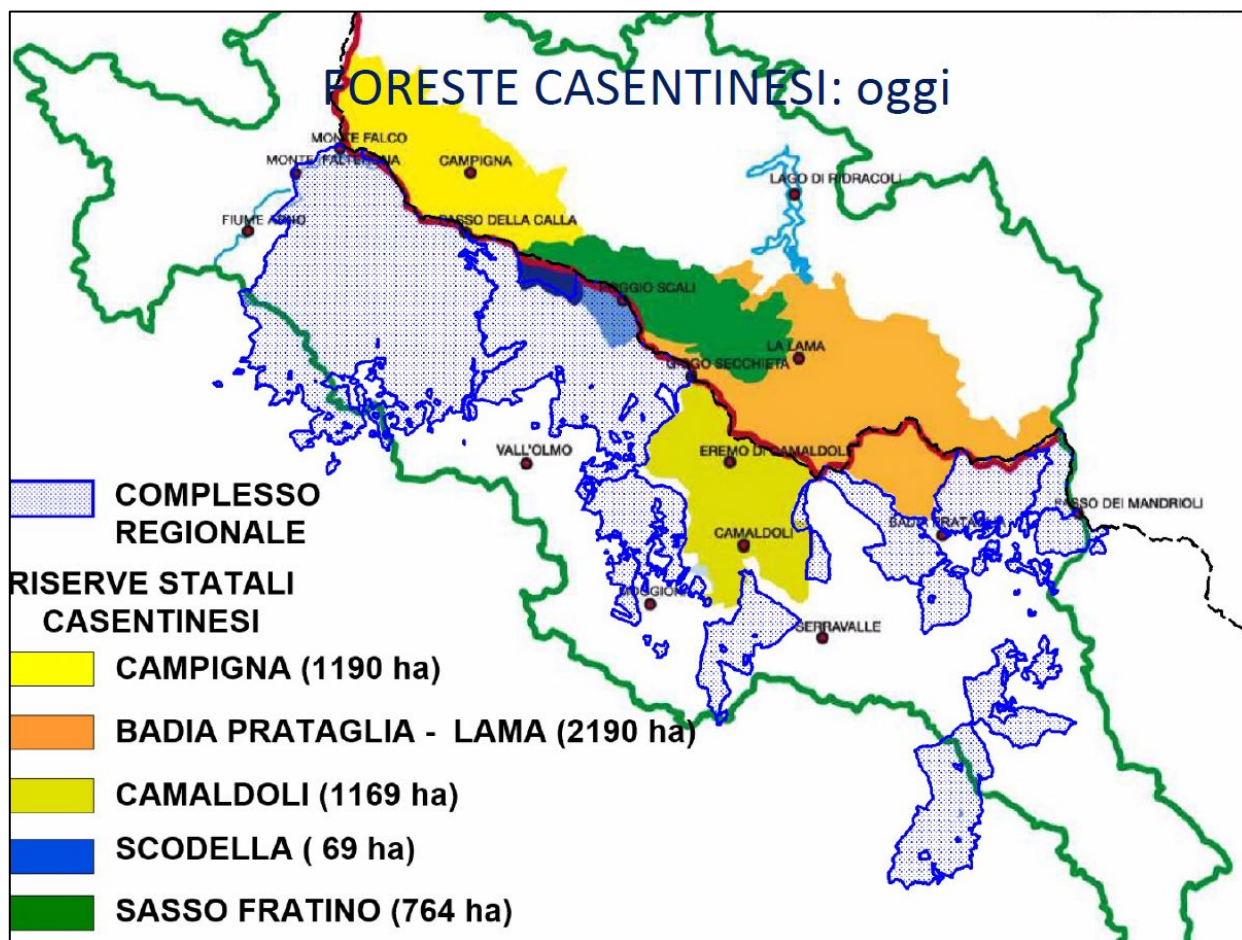


Figure 4: "Foreste Casentinesi" Regional Forest Complex today

The Unione dei Comuni Montani del Casentino is committed to work for the adoption of forest exploitation models aimed at improving the environment, sustainability and enhancing the territory. The goal is to ensure the preservation and improvement of its forest resources through sustainable forest management adopting a specific SFM policy. The commitment is addressed to:

- to the maintenance and improvement of forest resources
- to maintain the health and vitality of forest ecosystems
- the maintenance and development of the productive functions of the forest

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- the maintenance, conservation and improvement of the biological diversity of forest ecosystems
- the maintenance and improvement of the protective functions of forest management
- the maintenance of the functions and socio-economic conditions of the forest
- to support a local economy for the management of environmental resources
- absolute compliance with national and regional regulations in force
- to perform internal audits to check its performance.

The Unione dei Comuni Montani del Casentino intends to work in close synergy with local companies, promoting opportunities for growth and enhancement of local wood. In the same way, it intends to develop cooperation with other stakeholders, first of all the National Park, in order to implement the concepts of multifunctionality and sustainable development as well as promote all non-woody forest products, including ecosystem services.

Forestry activities carried out:

- Assignment of standing forest lots
- Interventions in direct administration (PSR/LIFE/Climate Park projects, etc.)
- Reforestation and cultivation care
- Maintenance of forest roads, rest areas, buildings, hiking trails, etc.
- Maintenance of open areas and fruit chestnut groves
- Extraordinary recovery interventions for dry, unstable, collapsed plants
- Implementation of planned forest interventions
- Forest nursery
- AIB service - Fire prevention.

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4.1 Forestry exploitation in the Casentino's Valley

Some numbers (average data) about forestry exploitation in the Casentino's Valley:

Casentino's valley surface: 83 km²

Inhabitants: 48.870

Forest's surface: 58 km² (70%)

FOREST COMPOSITION		
Coniferous high forest	Ha 9.018	15,9%
Deciduous high forests	Ha 5.799	10,2%
Coppice woods	Ha 41.159	72,7%
Chestnut orchards	Ha 684	1,2%
TOTAL	Ha 56.660	100%

Used forest area/year: 1,505 hectares

Volume of wood used/year: 132,560 m³

Yearly PLV for roadside timber: € 7,500,000

Number of employees in the utilities sector: 600

Forestry operations / year	Surface (Ha)
High forest	618
Coppice woods	887
TOTAL	1.505

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The data document the considerable economic value of forestry and wood production in Casentino which links residence and occupation and land maintenance in a complex context such as the Apennine mountains. In particular, it can be said that coppice, largely widespread in private property, is the most used form of government. The main reason for its diffusion, both in the hills and in the mountains, is above all due to their historical link with agricultural activity, as they are able to produce firewood, coal and poles of different sizes and characteristics. Firewood is still today the main woody assortment that is obtained from forestry uses and comes above all from the cuts of coppices, largely composed of oak species (*Quercus cerris*) and this is due to the increase in demand for biomass not only for private use, but also for thermal power stations and district heating networks.

Species	Surface (ha)/year
<i>Quercus cerris</i>	520
<i>Fagus sylvatica</i>	96
Chestnut	213
TOTAL	829

Table 1: forestry exploitation in privately owned coppices in Casentino (data reference period 2014-2016)

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ANNEX 1

Camaldoli Forest Code

The roots of sustainability

DOM SALVATORE FRIGERIO

<http://www.pro-natura.it/lettore-news/codice-forestale-camaldolese-le-radici-della->

The monastic community of Camaldoli, since its first rise around 1024, established a vital relationship with the forest environment, to the point of taking it as a symbol and guardian of monastic life. Here we find the node that connects the Camaldolese tradition to the biblical one.

In 1080 Rodolfo, the fourth Prior of the Hermitage, codified for the first time the habits of life of the Romualdine community (Liber eremiticae regulae aeditae a Rodulpho eximio doctore. Biblioteca della città di Arezzo, cod. 333, XI century). His work was expanded by Rudolf II at the beginning of the 12th century. In this new Camaldolese code, the Author offers us highly demonstrative pages of the relationship between the monks and the forest. In one page particularly rich in poetry, all the ascetic tension of the monks who live in harmony with the environment is collected, to the point of registering their "identification" with the trees. The passage (chapter 49) sings of the seven trees listed in the book of Isaiah as a sign of the fertility of the earth refounded by God (Is 41:19) and, contemplating their properties, he discovers in them the indication of those virtues that every monk must possess. But it goes further by stating that every monk must become those trees!

"I will plant, He says, in the desert, cedar and hawthorn, myrtle, olive, fir, elm and box". So if you desire to possess these trees in abundance or if you long to be numbered among them, whoever you are, make every effort to enter the quiet of solitude. In fact, there you will be able to possess, or become yourself a cedar of Lebanon which is a

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plant with noble fruit, incorruptible wood, with a sweet smell: that is, you will be able to become fruitful in works, distinguished for clarity of heart, fragrant for name and fame; and like a cedar that rises above Lebanon, to blossom with wondrous joy. You can also be the useful hawthorn, a healthy prickly shrub, suitable for making hedges, and the word of the prophet will be valid for you: "You will be called a rebuilders of walls, a restorer of safe roads". With these thorns the Lord's vineyard is surrounded: "so that every passer-by does not sell me your vineyard and the wild boar of the wood does not slaughter it nor the wild animal devastate it". You will also green like myrtle, a plant with sedative and moderating properties; that is, you will do everything with modesty and discretion, without wanting to appear neither too just nor too compliant, so that the good appears in the moderate decorum of things. You also deserve to be an olive tree, the tree of piety and peace, joy and consolation. With the oil of your gladness you will illuminate your face and that of your neighbor and with works of mercy you will comfort the mourners of Zion. Thus you will bear sweet and fragrant fruits "like a green olive tree in the house of the Lord and like an olive branch around his table". You will be able to be a tall fir tree, full of shadows and turgid with fronds, if you meditate on the highest truths, and contemplate celestial things, if you penetrate, with the high top, into the divine goodness: "knowledgeable of the things above". Nor does it seem cowardly to you to become an elm, because although this is not a noble tree in height and fruit, it is nevertheless useful to serve as a support: it does not bear fruit, but it supports the vine laden with fruit. Thus you will fulfill what is written: "Bear one another's burdens and thus you will fulfill the law of Christ". Finally, don't forget that you are boxwood, a little plant that doesn't climb very high but doesn't lose its green, so that you learn not to pretend to be very wise, but to contain yourself in fear and humility and, embracing the earth, keep yourself green. The prophet says: "Do not raise your head against the sky" and Jesus: "whoever humbles himself will be exalted". Let no one, therefore, despise or take into little account external ministries and humble works, because generally the things that appear most modest on the outside are the most precious inwardly. Thou shalt therefore be a Cedar by the nobility of thy sincerity and thy dignity; Hawthorn for the stimulus to correction and conversion; Myrtle for its discreet sobriety and temperance; Olive tree for the fruitfulness of works of joy, peace and mercy; Spruce for high meditation and wisdom; Elm for the works of support and patience; Buxus spp. because informed of humility and perseverance."

From Camaldolese code XII century

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The text extols virtues that belong to monks and trees indiscriminately, in a surprising mutual confusion. This page lays the foundation for all the loving and edifying attention the monks have given to "their" forest. It is from here that the work of passionate custodians unfolds, who reflect the turgor of their asceticism in the turgor of the forest and who find the stages of their monastic journey in the saplings planted. For this reason there will no longer be a subsequent legislation, concerning the life of the monastic community, which will fail to regulate the monk-forest relationship, until this is interrupted by civil suppressions which will take care of it away from the monks, in 1810 (Napoleonic suppression). and in 1866 (Savoyard suppression still in force). Therefore a completely unique forest legislation takes place: a separate code, specific for forest management, is not promulgated, but this is an integral part of the Constitutions that regulate the life of the monks. This is a unique case in all Christian monasticism. In 1520, printed with the wooden types of the brand new typography installed in the monastery, a book of great importance was published: the Rule of the hermitic life (Paulus Justiniani, Eremitice vite regula a beato Romualdo Camaldolensibus Eremitis tradita: seu Camal.Eremi Institutiones, Monasterio Fontis Boni MDXX, p.37 ff.). This is the first comprehensive legislation, promulgated by Prior Paolo Giustiniani, a learned Venetian humanist (1476-1528). This work, which we can consider the first well-articulated compendium of all the previous rules established by the Camaldolese, shows us how the relationship with the forest was an integral part of the rule of life of those monks. Silvano Razzi, abbot of the Florentine Monastery of S. Maria degli Angeli, gives us, in 1575, a translation of Giustiniani's Rule in the Tuscan language (Rule of the Eremitic Life... The Camaldolese Constitutions translated from the Latin language into Tuscany, edited by Silvano Razzi, Fiorenza MDLXXV, pp. 22-23 and p. 198). From this we take a few steps.

"... if the Hermits are truly studious of solitude, they will need to take very great care, & diligence, that the woods, which are around the Hermitage, are not diminished, nor diminished in any way, but rather enlarged, & grown. Fir trees can therefore be cut, for the construction of the Church, Cells, & other rooms, & workshops of the Hermitage; (...) with the sole license, & concession of the Major [the Prior. Ed]. Then when it is necessary to cut a greater quantity (...) this should be done, but with a special license from the Chapter of the Hermitage: in others, the license to cut Firs is granted. (...) Procure (...) with diligent care that in any case, four or five thousand Fir trees are planted each year, in suitable places, and close to the Hermitage. (...) Which thing, if by chance, one year (God forbid) is not done, the following year it is done for one,

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& for the other. Nor else can Firs be cut down, if this has not been done beforehand". the office of which is to be attended with diligent care and solicitude, that they are not cut off, offended, or actually damaged in any way; & see to it that again, as was said above in its place, they plant it. & to use every diligence to the planted ones, so that they can grow; & when you have to cut, show which and where it can be done with little damage to the beauty of the forest; & in short, diligently do all the things that pertain to the care and custody of the Firs".

In 1639 the new Constitutions of Camaldoli introduced the Forest Guard. Article 7 reads as follows:

"It is very important that the woods of our hermitages are well looked after and preserved, and therefore one has an eye on who the guardian of them is, and what condition: therefore he must be young and robust, who can once and again two, since it is necessary to surround the woods every day, and drive away the neighbors' animals, and make sure that no harm is done to us." (from G. Cacciamani, The ancient forest of Camaldoli, Ed. Camaldoli, 1965, p. 31).

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