

Short Rotation Woody Crops (SRC) plantations for local supply chains and heat use

Project No: IEE/13/574



Report on the identification of suitable growing areas SRC in the Trièves Region

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RAPPORT D'ETUDE

Réponse à la consultation Communauté de Communes du Trièves

Juillet - Septembre 2014



**THIS DOCUMENT IS A SUMMARISED
TRANSLATION OF THE STUDY REPORT
ISSUED BY THE CHAMBRE D'AGRICULTURE**

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1. Background

1.1. The energy market puts pressure on biomass supply chains

In a context of substitution of fossil energies with renewable energies, there is a growing interest and many speculations on biomass. The use of biomass, as biogas, wood fuel or 2nd generation fuels, are different work strategies identified to achieve the goals fixed by the Grenelle de l'environnement. In France, thanks to local sustainability programs, carbon credits and state subsidies, it is being developed rapidly. This dynamic is being realized at different levels: in individual homes, at an industrial level or through regional administrations, a variety of supply chains are being created nationwide.

Expectations are high, demand is important, use is progressing, and consumption is rising rapidly. Pressure on biomass is rising and there are many economic, environmental and societal issues at stake.

Questions are being raised about the availability of this resource, on how to structure supply chains, on quality issues, economic models, etc.

1.2. Biomass at the heart of discussions in the Trièves

Questions on energy are primordial in mountain territories like the Trièves, where mobility issues are a real preoccupation because of the cost of energy for families, companies and local administrations. Historically the Trièves is an innovative area in terms of energy plans. This explains why the Communauté de Communes du Trièves was candidate to become a "positive energy territory", aiming to be 100% renewable energy by 2050.

1.3. Several programs in creation

To reach this goal, several programs are being developed, to find effective solutions for producers and users of energy. Research programs, both national and international have been set up to explore the different ways to put forward energy produced by biomass and see what resources are available to fuel these initiatives.

1.4. Opportunities for SRC in the Trièves

Forest biomass, even with the limits due to difficulties in accessing the resource, is often listed as the priority, but interest is also growing around biomass from energy crops, of which SRC.

The Chambre d'Agriculture de l'Isère is aware of these issues:

- Opportunities for development and/or competition between food and non-food crops
- Land issues linked to change of land use to grow energy crops
- Agronomic balance of soils when large quantities of organic matter (straw) is exported from the land
- Reversible characteristic or not of energy crops production systems **has, from 2006 to 2009, worked on issues related to biomass**
- Strengthen the synergies between forest and agriculture to work together towards supply chains that complement one another. Encourage the development of forestry programs (roads, land reforms, groupment of owners) to make the forest a productive and sustainable economic sector
- Develop energy crops on land that will not enter in competition with food production (marginal lands/Study in 2009 – État des lieux des espaces non concurrentiels –

Friches agricoles et accrus forestiers en Valmonthays - offre potentiel en bois énergie)

- Work to develop sustainable practices, local dynamics and concerted local development programs

From 2010 to 2013, the Trièves took part in a European program « Bio-Régions » to develop biomass.

The contacts established during this program helped to set up a group of local stakeholders with motivations to develop biomass projects.

This program identified SRC as a potential source of biomass for the Trièves territory.

1.5. Trièves Forest Charter and SRCplus Project

SRC are very rare in the Rhône Alpes region and conducted more according to “conventional industrial models” on fertile, flat, easy accessed and well-irrigated lands.

The SRC+ Project of which is part the Communauté de Communes du Trièves, aims to set up local sustainable supply chains of SRC for heat production.

The Communauté de Communes Trièves, as part of the programs set up in its forest charter, is going to conduct a program on SRC experimentations for 3 years.

2. Aim of the consultation

The Communauté de Communes du Trièves wishes to test SRC in order to give value to lands that are not being exploited or are under-exploited.

The aim is to give a new value to these areas by inserting them in a supply chain that takes part in the development of local energy self-sufficiency as well as offering a new income for stakeholders involved.

Consultation: evaluate the potential for planting SRC in 3 zones identified by the CDCT:

Chichilianne : 4,62 ha / Prébois : 2,68 ha / Avignonet : 1,4 ha

Criteria taken into account:

- Fertility of the soil
- Resource in water and choice of varieties
- Quality of the soil and choice of varieties
- Exploitability (accessibility, mechanisation, service roads)
- Impact on the landscape
- Impact on biodiversity
- Impact on prevention of landslides

3. Study of proposed zones

The 3 zones studied were identified by the Communauté de Communes:

- Communal land, with forests not subject to the forestry regime (Étude cartographique 03/2014 Emmanuel BONNAIME – Proposition de parcelles ONF juin 2014).
- Lands situated under electricity lines.
- Marginal agricultural lands.

Trièves climate :

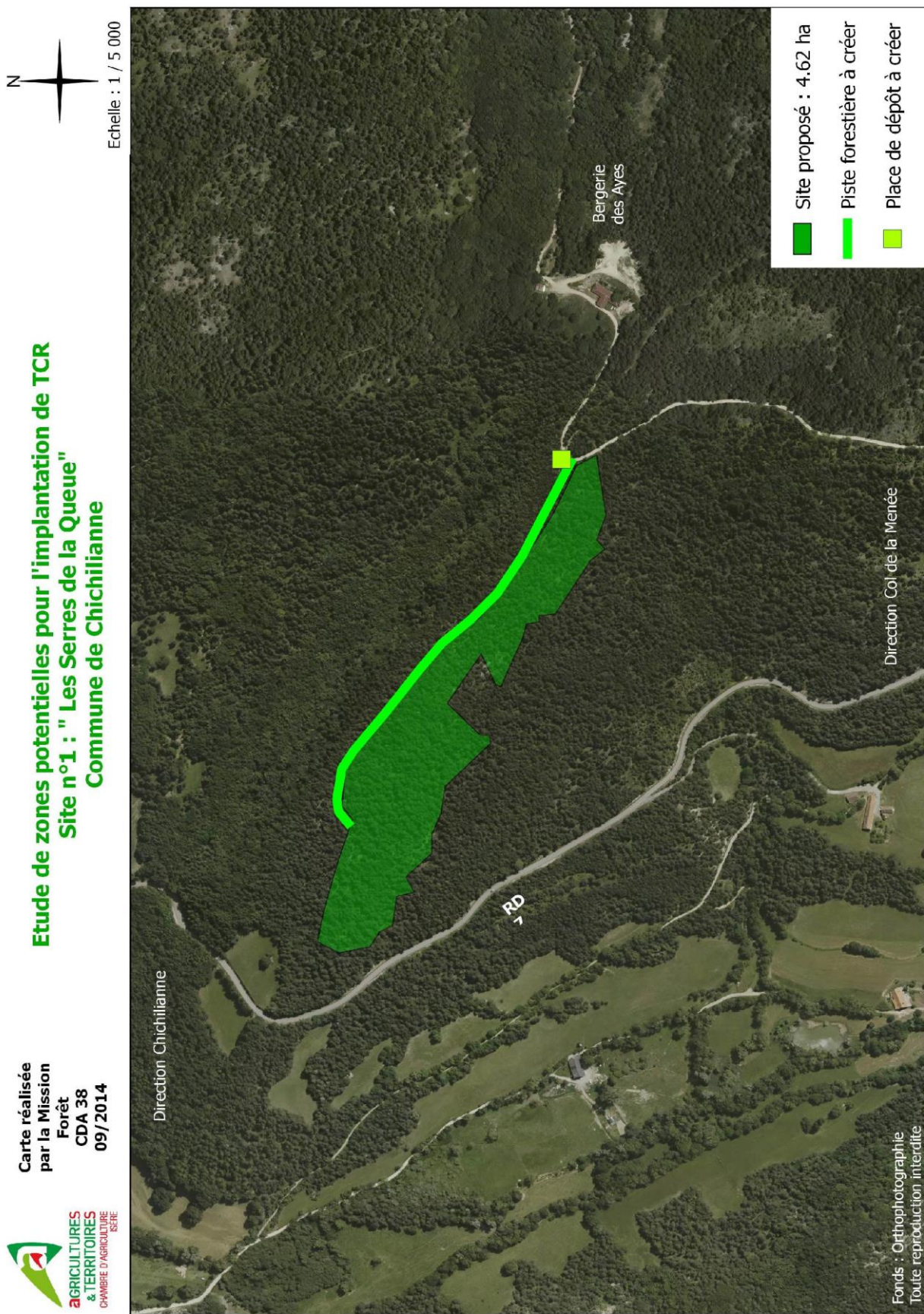
Trièves is part of an intermediary meridional climatic sector which corresponds to a subdued oceanic climate with Mediterranean characteristics. The three zones studied can be classified as such, the main differences between the zones being linked to altitude, topography and exposure.

General information:

- Annual average temperature: 5,9°C.
- Rain fall are around 950 mm/an (average of last 15 years) with possible droughts in summer and regular storms.

3.1. Site 1 Chichilianne

Figure 1: Site 1, Chichilianne



Location:

Situated on the Commune of Chichilianne, on the road going to the Menée pass. Access is done by

and is not subject to the forestry regime.

Characteristics:

Altitude from 1100 to 1200 m, sud-ouest facing, with a lot of sunshine. Limited water supply.

Average slope: 25 %. Possible mechanisation with forestry equipment. Access however will have to be created on the north side of the area, from path to track.



Figure 1: Access road

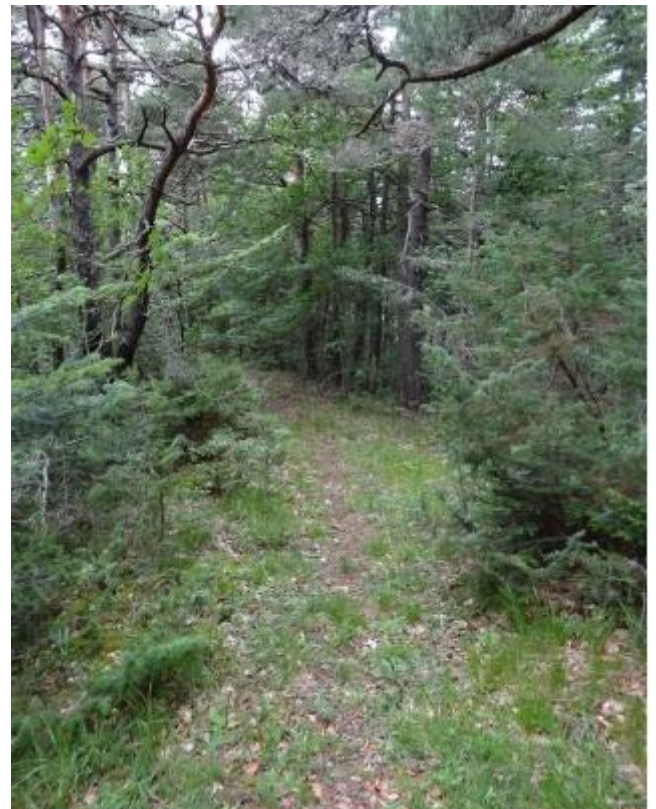


Figure 3: Access path, needing to be enlarged

Environmental zones :

Chichilianne village is part of the Vercors nature park.

The zone is not part of any nature conservation areas. (ZNIEFF, APPB, EBC, water protection).

Previous culture:

The area is actually covered in pine trees, with sporadic beech and fir trees. Trees implanted themselves naturally on these old pasture lands that have become marginal.

Landscape:

Forest growth all around the area means that SRC would not disrupt the local landscape.

Biodiversity:

Biodiversity index: 11 on 50, absence of old trees / dead trees.

Bedrock:

Bedrock composed of beige clay limestone and grey marl, formed around 145 million years ago. The base of the soil has a limestone texture. The very strong presence of active limestone in the soil can be a limiting factor for the growth of certain species.



Figure 4: Vegetation on site

Forestry potential:

Presence of large elements (superior to 2 mm) making auger sounding difficult. Presence also of ground rocks. Maximal depth found (6 sounding tests done): 40cm. Difficulty for roots to dig down deep.



Figure 5 : rocks on site

Water stockage is low because of lack of deep soils, added to the sunny exposure of the land: this is a limiting factor for growing trees.



Figure 6 : Tests



Figure 7 : Prospection

Botanical studies confirm the previous observations done on the area. Indeed, the majority of species present confirm the presence of a sunny exposure, limestone soils and who do not need much water supply.

Conclusions:

Limiting factors: Limited fertility, poor water supply

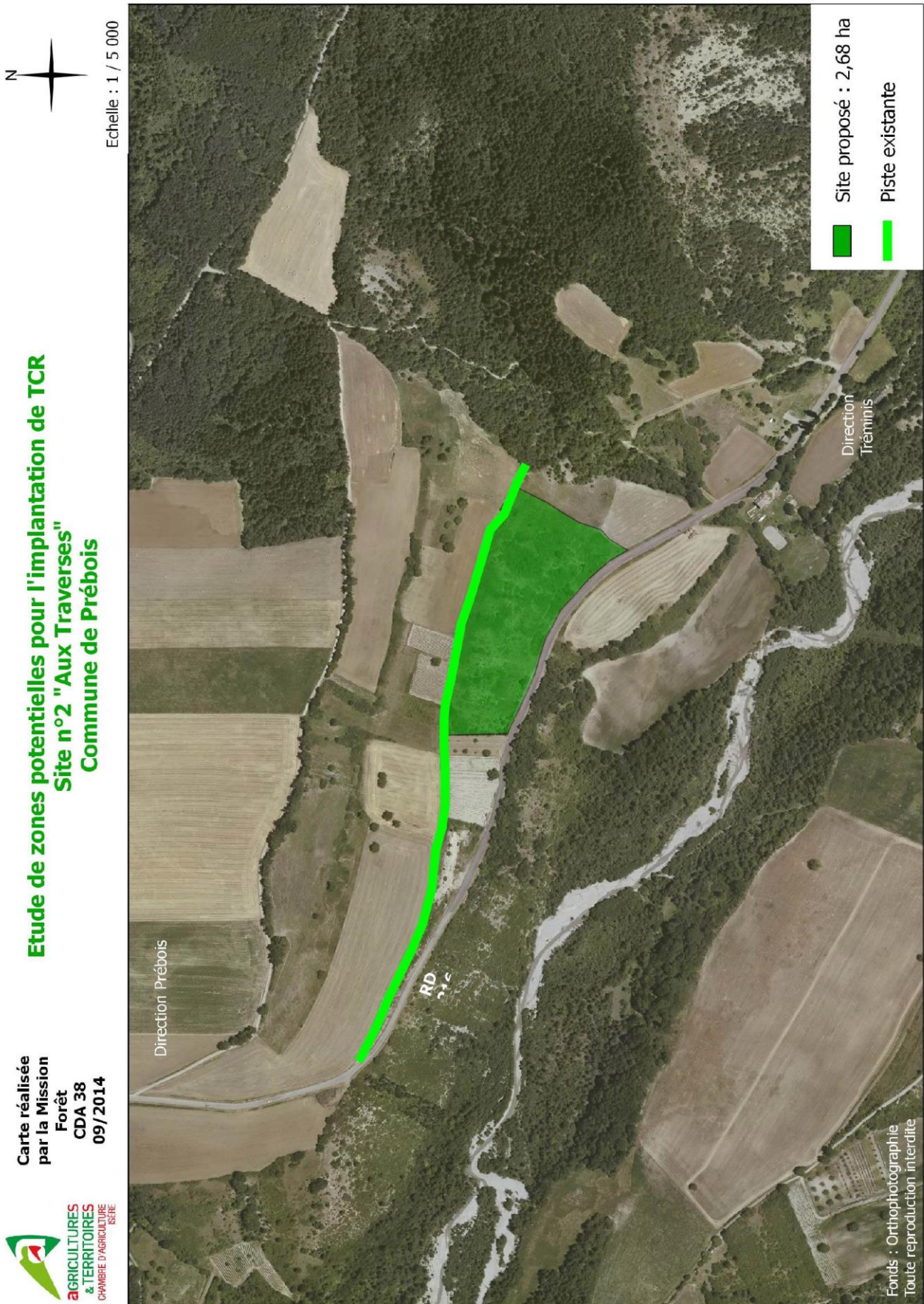
Favorable factors: possible mechanisation of the plot; low invest to improve access with trucks.

The low fertility of the plot will not permit profitable SRC plantations.

However the available wood and topography of the plot, make this area interesting for the production of wood energy. This could be coupled with a land change use, from wood to pasture, following the crop of available wood.

3.2. Site 2 Prebois

Figure 8 : Site 2, Prébois



The second zone to be studied is located in Prébois. It is located next to the departmental road going to Tréminis and by a track on its northern side. This track can be used by forestry trucks even though there is no place for them to turnaround at the end of the track.

The total surface of the plot is 2.68 ha, divided into 14 different plots belonging to several different private owners.



Figure 9 : Site 2

Topography and access:

The land is situated between 730 and 770m altitude, south facing and with good exposure to sunlight. This topography, as well as the climate, mean that there limited access to water for plants on that land.

Average slope is of 35%. Mechanization is possible, but not with a tractor used in agriculture.

Access for trucks can be done by the track above the plot but a turnover space would have to be created for larger vehicles.



Figure 10 : access road

Environmental aspects:

The zone studied is entered in two ZNIEFF areas, however this has no incidence on the right to plant SRC.

Previous culture:

The land was probably used for pasture and vines. They have not been used for several years and vegetation had grown on them.

Landscape:

The plot is well visible from the road. However, the implantation of SRC should not have a negative impact, in comparison with the actual aspect of the land.

Biodiversity:

The land is part of a ZNIEFF area; it must have therefore plants and butterflies of interest (hot and dry slopes). SRC implantation would undeniably modify this environment.

Bedrock:

Presence of rissien alluvium (sediments of local limestone). This is confirmed by the quarry located close by used for the construction of roads and tracks in the village.

Forestry potential:

The rocky structure of the land does not permit to sound the soil with an auger. Fertility can however be estimated by observing vegetation on site. Very few trees have grown in the area, notwithstanding the absence of human intervention there for a number of years. Only a few species have grown there (that prefer hot and dry environments and do have high needs in water).



Figure 11: presence of stones

This area does not have a great potential for growing trees.

Conclusions:

Limiting factors : low fertility, low water stockage.

Favorable factors : good access and possible mechanization.

The low fertility of the plot will not permit profitable SRC plantations.

3.3. Site 3 Avignonet

Figure 12: presence of stones

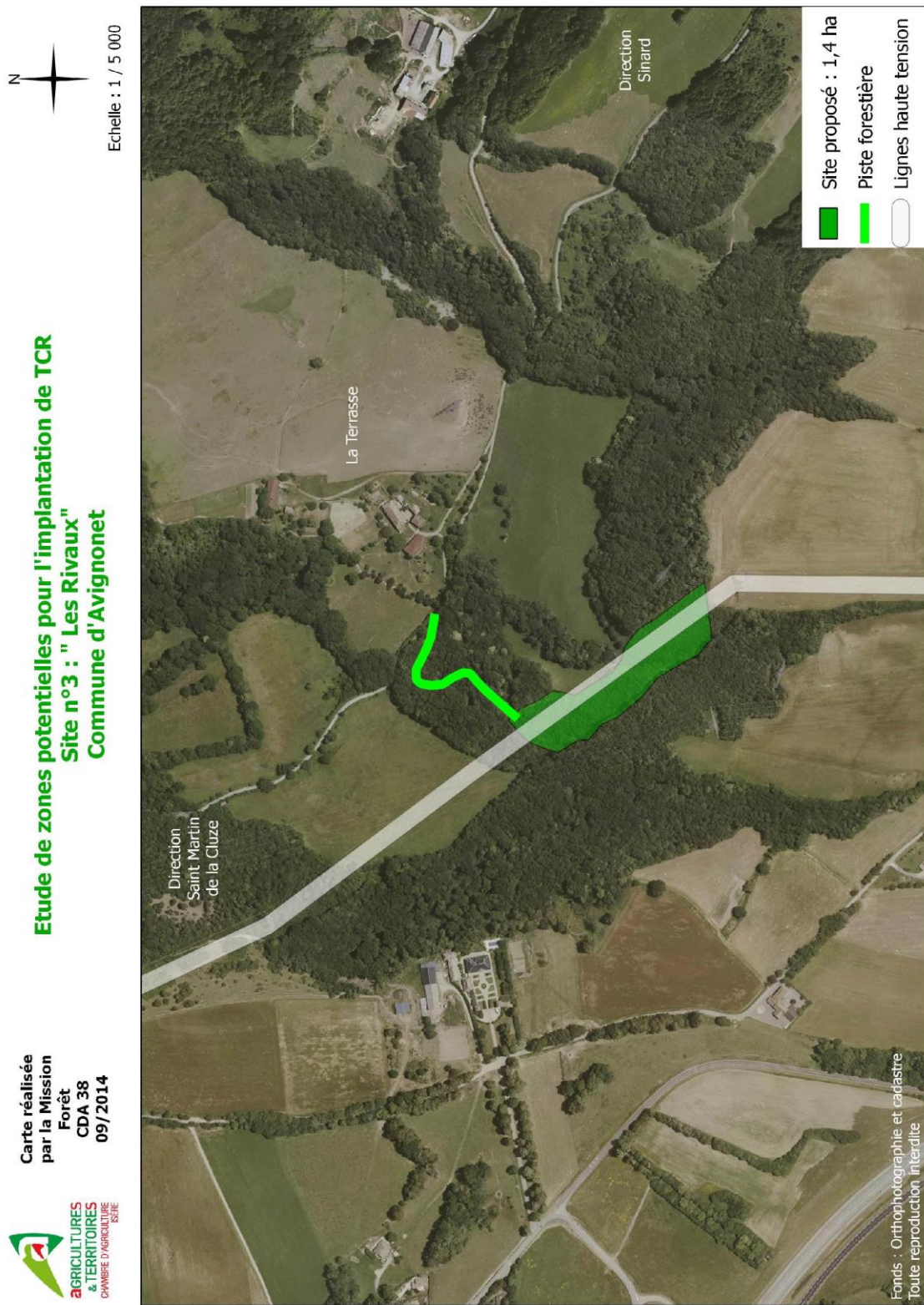




Figure 13: Site n°3 under high voltage lines

Localisation:

The last zone studied is located in Avignonnet village. It is composed of 4 plots for a total surface of 1.4ha.

Access is done by a forest track leading off from the village road. The forest track can be used to exploit the plots. It belongs to the owner of the area studied.

Topography and access:

The area studied can be divided into three distinct zones (cf map). Their exposure varies from north to north-east and the average slope is of 30 to 50%, the area with most slope being on the south of the area.

Mechanisation with a tree feller and a carrier is technically possible everywhere except the last area which is too steep and would need to be worked with a forestry tractor. The configuration of the area makes it difficult to exploit since forestry carriers cannot work in slanted areas and therefore plantations must be done according to the strongest slope line of the area. In this case this slope line is different in the three zones mentioned above.

The presence of a high voltage electricity line above the area adds a constraint as well since the maximum height of the plantation must be controlled.

Environmental factors:

The area is not part of any environmental perimeters.

Previous culture:

The area was previously occupied by a forest with a dominance of lob-leaved trees. The implantation of a high voltage electricity line in that area means that the trees must be felled regularly by the administrator of the line. Once cut, natural shoots reappear: beech, chestnut, willow, ash and alder being the main species to grow.



Figure 14: tests on soil

Landscape:

The area is not easily visible because it is surrounded by forest. Furthermore, its actual look is similar to an SRC plantation (short rotation felling and regrowth of coppice). Therefore, implantation of SRC in that area would not alter the landscape much.

Biodiversity:

This area of coppice is a refuge zone for wild fauna, of which birds notably. The absence of big pieces of dead wood on the ground or standing restricts the development of entomological fauna.

The implantation of SRC in the area would not greatly modify the biodiversity in the area.

Forestry potential:

Several auger soundings were made to evaluate the fertility of the area. Maximum depth is of 65cm, of which:

Table 1: holding capacity of the soil

Horizon	Colour	Texture	depth (cm)	HCl Test	rough elements (%)	Traces of hydromorphy
1	Brown	LSA	33	Negative	5	No
2	dark brown	LAS	32	Negative	10	No

The holding capacity of the land is medium. It is sufficient in any case for the implantation of an SRC plantation.

The presence of beech of more than 25m in the land bordering this area indicates that the area is fertile.

Conclusions:

Limiting factors: presence of a high voltage electricity line limiting the height of the trees that can be grown underneath, small surface of the area.

Favorable factors: good fertility, good water reserves

Of the three zones studied, this one is undeniably the one with the best forestry potential. However, the presence of the electricity line and the small surface of the area are obstacles to planting a profitable SRC plantation. Solutions will have to be found in order to compensate these difficulties. The trees that must be regularly felled in the area could be used to produce wood chips.

4. Summary

Table 2: summary of results

	<i>Access</i>	<i>Mechanisation</i>	<i>Fertility</i>	<i>Water</i>	<i>Implantation of SRC</i>
Site n°1	good	possible, need to create a track	average	average	No
Site n°2	good with need to create turnover space	possible	bad	bad	No
Site n°3	average	possible, need to create a storage area	good	good	yes, with constraints