

Monumental trees inventories at different scales: objectives and perspectives

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Abstract

In the late 90's several Regional authorities established regional catalogues of monumental trees by means of regional laws. Anyway, at national level a clear definition of *monumental tree* still doesn't exist, while at regional scale each region gives different interpretations. Furthermore, inventory methods are very different between regions and at different scales: relevant differences are found in the objectives, in the methods and in the inventory's subject itself. The paper first focuses on differences in objectives, methods, and information collected by existing inventories.

The new Province Pistoia Co-ordinate Territorial Plan promoted an inventory of veteran trees in order to establish an exhaustive data base. The inventory was the occasion to test the effectiveness of larger scale initiatives in the identification of veteran trees at local scale, and to verify the capability of a local inventory to supply relevant information on veteran trees at regional and national scale, too.

Keywords: Veteran Trees, Monumental Trees, Trees Inventory

1. Introduction

In 1982, the Italian National Forest Service (C.F.S.) began the first inventory of Italian monumental trees. That was the first attempt to inventory a natural heritage which is still not explicitly considered by national laws, as also the recent Code of Cultural Heritage and Landscape does not recognize to trees the *status* of monuments to be preserved by themselves, but only as part of parks, gardens, or landscapes of particular value (Piutti *et al.* 2004). This gap is partially bridged by several Regional authorities which in the last ten years recognized the value of veteran trees by means of regional laws, which in most cases defined the status of monumental tree, the rules for trees protection and valorisation, and established regional catalogues of monumental trees. Anyway, at national scale a common definition of monumental tree is still doesn't exist, while at regional scale each region gives different interpretations and definitions pointed out both on intrinsic (age, dimension, etc.) and extrinsic characteristics (landscape or architectural functions, references to historical events or to local traditions, etc.) of the tree.

As definitions are quite similar, inventory methods and informative contents are very different from region to region and, of course, at different scales. Relevant differences are found in the objectives of inventories (trees protection, trees management and valorisation, divulgation of environmental values, promotion of rural landscapes, tourism, etc.), in the methods (from simple lists to complex databases) and first of all in the inventory's subject: single trees, groups, etc.

Veteran trees are sometimes taken into account by planning tools at various levels, as Co-ordinate Territorial Plans (P.T.C.) at Provincial scale and, rarely, by Structural Plans at Municipal scale. Sometimes, is a regional law that compels Provinces to explicitly consider trees in their P.T.C., as in the case of Region Lombardy.

In Tuscany, veteran trees are protected by Regional Law n. 60/1998, which established the regional list of monumental trees, but gave no suggestion about inventory methods, leaving to single Municipalities the possibility to signal trees of particular value. Anyway, some Provinces recently realized inventories at local scale. An example of local inventory of veteran trees has been recently promoted in the frame of the new Province Pistoia Co-ordinate Territorial Plan. The first step of the inventory consisted in a comparative analysis of previous inventories at different scales, in order to focus inventory's objectives and information to collect. Furthermore, the inventory was the occasion

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to test the effectiveness of initiatives at regional and national scale in the identification of veteran trees at local scale, as a comparative evaluation of all actions undertaken till now pointed out a basic incommunicability between different lists. Vice-versa, it was the occasion to verify the capability of a local inventory to supply relevant information on veteran trees at regional and national scale, too.

2. Trees monumentality: definitions

We have yet remembered how a single definition of monumental tree still doesn't exist in Italian legislation, while is quite clear from a number of scientific papers which parameters must be considered in to evaluate the monumentality of a tree (see Caramiello and Grossoni 2004, for an overview on factors affecting monumentality). Furthermore, each regional law gives its own definition of monumental tree: in most cases, these definitions are very close to a common sense of monumental tree and give poor practical information for recognizing the monumental value of trees.

At least three regional laws share the following definition of monumental tree: “*isolated trees or trees included in natural or artificial woods which can be considered as rare examples of majesty and longevity*” or “*trees which have an accurate reference to relevant events or memories from an historical or cultural point of view, or to local traditions*”. This definition, that was adopted by region Tuscany, Piedmont and Veneto, as far as correct and rigorous, does not give practical evaluation elements. Furthermore, this kind of definition contemplate only some of various criteria determining monumentality, those concerning tree morphology, age or cultural aspects.

Another possible approach is proposed by region Lombardy which, instead of giving a verbal definition, takes into account all possible factors affecting monumentality, from biologic criteria (size, rarity, etc.) to cultural aspects. All factors are then evaluated by assigning scores, which sum in a comprehensive monumentality score (Lenna and Galasso 2004). Anyway, dimensional limits for each species (or group of species) are fixed, although exceptions can be admitted.

Dimensional limits may be often criticized: they are not only very changeable with the territorial context, but also with local protection policies, *i.e.* with a stronger or weaker interest in protecting trees by local authorities. For example, region Marche law on veteran trees consider hundred-year old trees all trees having a trunk thicker than a limit fixed by law for each species. Those limits, for much species, are often questionable: for example, this limit amount for *Populus alba* to a dbh of only 80 cm.

Other regions, instead, apply a very restrictive approach: region Valle d'Aosta considers as monumental only trees older than 200 hundred years.

3. Monumental trees inventories in Italy

In Italy, monumental trees inventories were carried both at national scale and local scale.

At national scale, the C.F.S. inventory (Alessandrini *et al.* 1992; Cagnoni 2005) was based essentially on previous knowledge by personnel of peripheral C.F.S. headquarters. The inventory led to significant results: from the 22.000 trees initially signalled, 1.255 trees in whole Italy were selected as trees of particular interest (Figure 1).

At regional scale, only some regions have a regional law on protection and valorisation of veteran trees, and among them only few provided for a regional inventory or gave guidelines to local authorities for the identification of monumental trees.

All regions which does not provide for an inventory of veteran trees generally follow the same procedure for establishing and updating the regional list, consisting in a call for mentions to local authorities, associations, citizens and so on, and in the following check by a regional scientific commission.

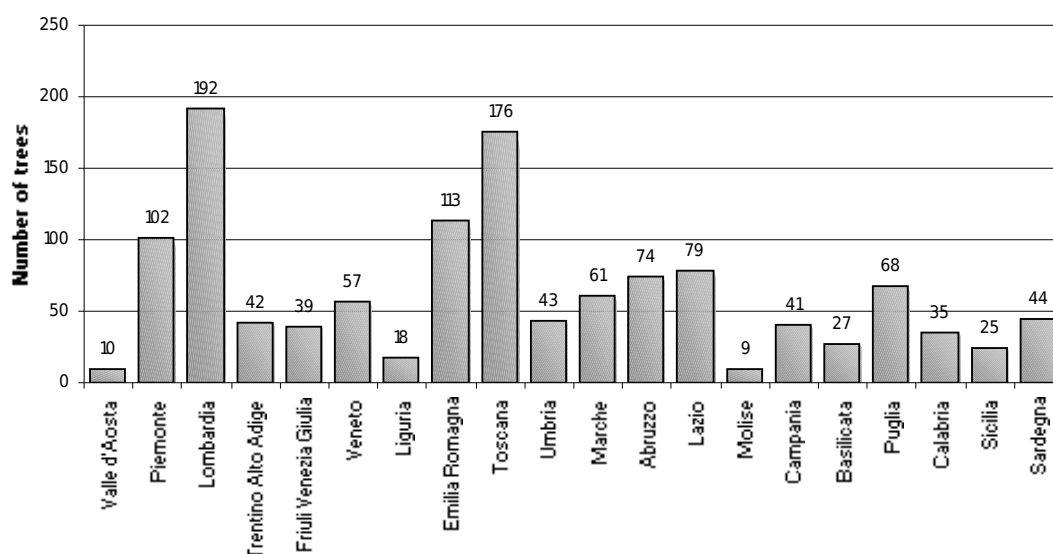


Figure 1. Results of C.F.S. national inventory of veteran trees.

Regions which now have a proper inventory of monumental trees are only four: Liguria, Lombardy, Veneto and Emilia-Romagna. While region Liguria and Veneto led the inventory at regional scale, in Lombardy and Emilia-Romagna Provinces were delegated.

As a common basis exist for all regions (C.F.S. inventory), it is possible to evaluate the accuracy of information reported by various inventories. Table 1 reports number of trees identified in each region by C.F.S. and by regional inventories or lists. Of course, the low consistency between data from different sources feels the effect of a different work scale. Anyway, the scarce coherence of some data is quite evident: a number of 2.055 trees identified by Lombardy regional inventory (and not in the whole region) is very unlikely compared to 192 of national inventory for the same region, as 938 trees in Veneto compared to 57. These differences can not depend only on work scale but sure involve the lack of common definitions and of common inventory protocols.

Table 1. Trees identified by C.F.S. national inventory, by inventories at regional scale and by regional lists.

	No. of trees		
	C.F.S. National Inventory	Regional inventories	Regional lists
Valle d'Aosta	10		125
Piedmont	102		27
Lombardy	192	2055	
Trentino-Alto Adige	42		448
Friuli Venezia Giulia	39		34
Veneto	57	938	
Liguria	18	118	
Emilia Romagna	113	546	
Tuscany	176		49

A further confirmation to this comes from the comparison between regional and provincial lists, when the latter is realized independently. For example, the inventory of Province Padua (region Veneto) lists 92 trees, that is almost half of the 180 trees listed for the same Province by the regional inventory: of course, this is caused by different interpretations of the same definition of monumental tree (fixed by the regional law), as scale level is the same for both inventories.

4. Monumental trees at local scale: the inventory of Province Pistoia

Tuscany has a regional law about protection of monumental trees since 1998 (L.R. 68/1998). Unlike other regions, the law neither established an inventory of monumental trees nor laid down guidelines to local authorities to identify this heritage: the list is the result of non-systematic mentions by municipalities. So, some Provinces realized local inventories: it was the case of Province Pistoia, Arezzo and Siena, which yet realized a provincial inventory, while other Provinces provided for it in their P.T.C.

The Territorial Resources Planning Service of Province Pistoia, back in 1989, set up an inventory by which forty-one monumental trees were identified, most in the mountain area of the province (but the inventory took into account only a part of the territory). In the frame of the new Co-ordinate Territorial Plan (P.T.C.), a new research was realized in order to extend the inventory to the whole province and to establish an exhaustive data base concerning trees' consistency and health conditions.

The procedure involved in the inventory, based on previous experiences, can be summarized as follows:

- First of all, a list of trees of particular interest was compiled by means of previous knowledge, mentions by citizens, associations and so on, by examining existing bibliography on historical villas and gardens, and by a research on toponymy.
- Then, each tree was checked on the field and relevant information about tree conditions were recorded; these included tree identification and localization, morphology, physiological and biomechanical aspects, sanitary conditions. After all, some management notes were given, including a short description of threats against the tree's conservation, and technical and operative notes, in order to suggest to the owner a correct management plan.
- Still in the field, accurate trees' geo-referencing by GPS was achieved, in order to obtain a certain tree identification on site.
- At least, an archive research allow the collection of relevant historical notes related to each tree.

As the inventory had also the objective to propose trees for the regional list of protected trees, on the basis of collected information trees were distinguished in trees of relevant value at provincial scale and at regional scale, in order to submit the latter to the regional Scientific Commission.

All information were collected in a proper database, provided with forms for data input and visualisation, which allows a prompt data recall and update by the user. Data is recalled through several pages, each containing information on tree identification, tree conditions, health conditions, management notes and monumental aspects. The archive has also the aim of promoting monumental tree to the public: basic information on trees and related cartography, as well as indication for reaching each tree, is available on Province's web site.

4.1 Results and discussion

The inventory identified 103 trees, belonging to 43 different species. Most represented species are beech (*Fagus sylvatica*, 12 trees), holm oak (*Quercus ilex*, 8 trees), chestnut (*Castanea sativa*, 7 trees), white oak (*Quercus pubescens*, 7 trees), cypress (*Cupressus sempervirens*, 6 trees), Turkey oak (*Quercus cerris*, 5 trees) and maple (*Acer pseudoplatanus*, 5 trees).

Of total 103 trees, 92 were considered as tree of great interest at least at provincial scale, while 11 trees satisfied laws' requirements for the registration in the regional list.

Trees are placed over the territory of fifteen municipalities, but three municipalities contributes with 57% of total trees, percentage which raise to 81% considering the 6 first municipalities in number of trees. In seven municipalities out of twenty-two were found no trees: as these municipalities have a significant heritage of historical villas and gardens, this result seems very unlikely, but this gap can be explained, on one hand, by scarce interest by local authorities and, on the other hand, by a certain distrust by both local authorities and private owners, probably worried about the imposition of a non-existent law obligation.

Table 2. Sources of information.

Source	Percentage of trees
Mentions by citizens	40%
Mentions by local authorities	4%
Bibliography	32%
Found directly in the field	24%

The response by private citizens was, all in all, positive, as 75% of total trees were found in private properties, and only 25% in public properties. Concerning sources of information (Table 2), 40% of total trees were found by means of mentions by citizens, and only 4% by mentions by local authorities. Other sources of information at local scale reporting remarkable trees, as urban planning tools (called Structural Plans in Tuscany), demonstrated very scarce reliability, and none of the trees listed in Structural Plans overcame field check.

As regards size, inventoried trees are often very significant even if compared to national inventory: seventeen trees overcome five meters of circumference at breast height, and forty-two trees four meters of circumference. Table 3 reports most remarkable trees inventoried in the work. The list includes the only tree registered in the regional list of protected trees, the so-called “*Canadino oak*” (*Quercus pubescens*) in Lamporecchio municipality. Note that other trees belonging to the *Quercus* genus are both thicker and older, and have also more relevant landscape and aesthetic value.

Table 3. Most remarkable trees in provincial inventory. *trees now listed in the national list. ** trees now listed by regional list; in bold, trees proposed for the regional list of protected trees of Region Tuscany.

Species	Location	Circumference at breast height (cm)	Estimated age	Rank in the national list
<i>Fagus sylvatica</i>	Tanabetti	782	315	4
<i>Picea abies</i>	Tanabetti	645	415	1
<i>Quercus cerris</i>	San Marcello Pistoiese	611	615	2*
<i>Thuja gigantea</i>	San Marcello Pistoiese	610	130	2*
<i>Cedrus libani</i>	Groppoli	544	>150	40
<i>Abies alba</i>	Macchia Antonini	531	260	3*
<i>Acer pseudoplatanus</i>	Cutigliano	527	150-200	10*
<i>Platanus x acerifolia</i>	Pistoia	510	200	4
<i>Quercus ilex</i>	Lanciole	505	215	17
<i>Quercus cerris</i>	Montagliani	504	415	10*
<i>Quercus cerris</i>	Mavigliana	502	415	11
<i>Platanus orientalis</i>	Quarrata	501	265	31
<i>Platanus x acerifolia</i>	Pistoia	485	150	5
<i>Platanus orientalis</i>	Monsummano Terme	484	-	32
<i>Abies alba</i>	Abetone	474	240	10
<i>Platanus orientalis</i>	Piuvica	473	150	33
<i>Cedrus libani</i>	Groppoli	470	>150	55
<i>Sequoia sempervirens</i>	Ponte alle Tavole	453	300	13
<i>Fagus sylvatica</i>	Taufi	450	>200	62
<i>Quercus pubescens</i>	Farabonzi	447	265	102**
<i>Calocedrus decurrens</i>	Villa Amalia	425	200	-
<i>Cupressus sempervirens</i>	Groppoli	400	>200	13
<i>Cinnamomum camphora</i>	Villa Stabbia	397	>200	6
<i>Juglans nigra</i>	Villa La Magia	331	185	-

The “*Tanabetti spruce*” (*Picea abies*) is probably the most interesting tree inventoried in this work; several times shot by lightning, the crown acquired a particular candelabra shape which is quite unusual for the species (Figure 2). The spruce has a circumference at breast height of 645 cm, that

means a dbh of 205 cm. Compared to spruces of largest size of other inventories (including C.F.S. national inventory), this is now the thickest spruce in Italy.



Figure 2. The Tanabetti spruce (*Picea abies*).

Generally, inventoried trees belongs to species characterizing respective bioclimatic bands; anyway, some trees were found in unusual location, as regards species ecologic characteristics, and this was considered a further factor enhancing monumentality: this was the case of *Cornus mas* and *Carpinus betulus* found in the site known as “Pracchie di Pontito” (Figure 3), by the Apennine crest between Pistoia and Lucca Provinces.



Figure 3. *Cornus mas* (Pracchie di Pontito, Pescia).

Much trees located in gardens and parks belong, of course, to exotic species, and some botanic rarities (referring to Tuscan territory) were also found as, for example, *Acer palmatum*, *Osmanthus fragrans* and species of the *Cinnamomum* genus. Exotic conifers as *Araucaria auracana*, *Thuja gigantea* or *Calocedrus decurrens* are quite common, as a result of the frequent use of these species in the 19th century landscaping practice.

Trees located in field edges, pastures and meadows are not very common, but they often play a key role in landscape characterization. It is the case of trees located in field and pastures edges by Cima Tauffi, where mixed field trees rows of *Fagus sylvatica*, *Acer pseudoplatanus*, *Prunus avium* and *Sorbus domestica* play a significant role in the perception of proportions in open spaces and in highlighting minor geo-morphological features. In the plain, remarkable field trees are rare, as a result

of a decade-long process of simplification of rural landscape. A particular attention must be paid to the conservation of those trees, which are often witnesses of a vanishing rural landscape and often play a remarkable ecological role as habitats and corridors for much species, especially those tied to the dead wood food-chain.

The comparison between data of regional list, national inventory and present inventory (Table 3) allow some general considerations. The list of national inventory includes 13 trees from Province Pistoia, which not comprise some of more remarkable trees identified by provincial inventory: of the eleven trees proposed for the regional list, five were yet listed by C.F.S. and six more trees were identified in the inventory. These six trees includes, for example, the remembered Tanabetti spruce, which would rank first of its species in the national list. So, the inventory was able not only to supply significant information at provincial scale, but also at regional and national scale.

Another key task of the inventory was the identification of remarkable trees at short-term risk of conservation. This risk is significant for at least thirteen trees, which require active intervention to ensure conservation. The inventory offers technical basis for establishing a correct management plan, which can be put into practice through the financial tools provided for by regional laws (L.R. 60/1998, L.R. 39/2000), but which are taken into account very seldom. Anyway, the inventory was also the occasion to improve private owner's awareness of the importance of proper management of these trees, and some of them yet provided for maintenance interventions entrusted to certified arborists.

5. Conclusions

Awareness of the value of monumental trees progressively increased in the last twenty years. But, further efforts are necessary to make local authorities aware of the importance of careful inventories, as basic tools to identify and consciously manage veteran trees. As this short report highlights, regions which still carried out an inventory had remarkably better results than those which only established lists based on call for mentions.

Furthermore, a basic incommunicability comes out between different scale, different territorial contexts, and also between inventories realised at the same scale in the same Region. Two basic factors contributes to this, both concerning the definition itself of monumental tree: differences in definitions and criteria of selection, and the excessive subjectivity in the interpretation of the definition. So, common definitions and inventory protocols must be prepared in order to collect coherent information, at least at regional scale.

As far scale is concerned, provincial scale seems to supply best results, if monumentality is not assessed with excessively generous criteria. Provincial scale is a good solution for several reasons:

- Province is the level at which landscape is properly planned, and at which information on natural resources is generally acquired and managed, in the frame of Territorial Co-ordinate Plans;
- Province is probably the most suitable level for the promotion of natural resources of rural landscapes;
- It is a good compromise between regional scale (which is often too large) and local scale, as information coming from municipalities is often unreliable, and as municipalities are often distrustful to this initiatives.

If Province seems to be a good scale level for research of monumental trees, directives are indispensable at regional scale, in order to avoid scarce coherence of information between provinces, and this concerns, first of all, unequivocal definition of monumental tree. The attempt of Region Lombardy is, from this point of view, very interesting, and should be tested in other territorial contexts for further development.

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