



Maintenance and Management Guidelines for Veteran Trees and Deadwood

*„Ecological network for *Osmoderma eremita* and other species dependent on veteran trees“*

LIFE16 NAT/LT/000701

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Developer: Lithuanian Fund for Nature

Aim of the Guidelines

Due to their age or regular wounding by pruning quite many trees growing in the cities have become habitats for rare animals or fungi. Such trees provide the same "services" as their younger relatives (air cleaning, cooling, noise suppression etc). But they are much more important for the preservation of biological diversity. Management of such trees should be carried out considering such most important factors as benefit for people and nature, status of the tree and the site where they grow.

The aim of the Guidelines is to create conditions for recreational and biological diversity preservation functions in the forests. By said guidelines we aim to provide:

- Recommendations for the assessment of the status of the veteran trees and for the establishment of the possibilities for their conservation.
- Recommendations for leaving deadwood of different types.
- Recommendations and standard solutions for the removal of threats.
- A communication strategy in order to explain to the society about importance of veteran trees and deadwood in city forests and other sites.

Application of the Guidelines

These Guidelines are intended for the protected city forests in which activities of the project "Ecological network for *Osmoderma eremita* and other species dependent on veteran trees" (LIFE16 NAT/LT/000701) will be carried out. These are proposed sites of community interest: Kaunas Oak Forest and the Slope of the Neris River by Verkiai.

Based on the example of these sites the guidelines can be applied to all forests where co-ordination of environmental and recreational interests is required: city parks, old estate parks, old forests in which educational paths or other facilities are installed to promote attendance.

Elements of forests significant for the survival of biological diversity

Use of Lithuanian forests historically developed in such a way that the oldest trees of Lithuania grow in city and estate parks - pine trees aged 180-220 years are soughing in Vingis Park, oaks aged 250 years are still growing in Verkiai Manor Park, as well as limes and spruces. Kaunas is famous for oak trees reaching the age of four hundred years in the oak forest of Aukštieji Šančiai, Kaunas Oak Forest and Vytautas Park. Not only people enjoy these and many other parks of Lithuania – they are useful for protected birds, insects and mammals who find their habitats in the old trees. On the trees and their remnants grow fungi and moss species included in the Red Data Book of Lithuania. City parks often become protected areas– they are attributed to the status of the reserves of regional parks or are declared to be Natura 2000 sites of community interest.

All forest areas valuable from the point of view of nature are characterised based on two elements: trees and deadwood.

Veteran trees and deadwood are valuable from the point of view of nature because:

- They provide homes for *Piciformes* birds, owls and bats which nest in the hollows and cavities. Huge old trees are used by some birds of prey.
- They are a source of food. Insects and fungi directly subsist on wood. They are very selective and specialized, feed just on a particular type of wood.
- Slow down climate change and return nutrients back to the soil. Trees, while using carbon dioxide, „lock“ it in their trunks. Forests form an ecosystem with the biggest accumulation of carbon dioxide. Disintegration of dead trees can last hundreds of years resulting in the gradual release of carbon dioxide. Decaying trunks return nutrients back to the forest for the use of other trees.

123 insect species are included in the Red Data Book of Lithuania and over 30 of them are found in forests. The biggest threats for protected species of forest insects are caused by the lack of deadwood and old trees in the stand. Of 112 fungi species included in the Red Data Book of Lithuania as many as 103 species are found in the forests. A bigger part of protected fungi are relics of the old forests, therefore they are found only in the stands which have reached natural maturity. 70 % of these species are mostly threatened by tree logging, and existence of 35 species depend on deadwood of large diameter. 63 species of lichens are included in the Red Data Book of Lithuania of which 50 % grow in the forests. 80 % of them rely on deadwood and 15 % of protected lichens grow on the old trees only.

Recommendations for the assessment of the status of the veteran trees and their conservation possibilities

Most often, veteran trees are also important as aesthetic elements of the visited forests and as a potential habitat for rare organisms. Assessment of their status should be done based on two aspects: by identifying risks for human safety and importance for biological diversity.

Identification of risks for human safety. Two significant aspects are rated:

- **Physiological status of the tree.** It is defined by specialists who assess the tree's ability to withstand winds, condition of the root system and etc.
- **Factor of the location.** The type of potential damage caused by the broken tree is assessed. Based on this factor, requirements for physiological condition of the trees growing by the paths should be much higher than for the trees growing offside, which might not require assessment of their physiological condition. In the recommendations we offer to divide the trees into two categories when they are assessed according to the location where they grow:
 1. **Territories by the paths or other places visited by people.** Trees which grow by official paths at the distance equal to 1.5 of the height of the trunk. Official paths are paths which have a cover and are marked on the plans etc.
 2. **Other places.** Other territories in which visiting is episodic or doesn't exist at all.

The tree can be of a very poor condition, but it can grow offside posing no big threat. There can also be an opposite situation - a tree of a satisfactory condition, but growing by the lively street or school may pose a big threat. The factor of the location is equally important as the condition of the tree. So, a sum of two factors is assessed:

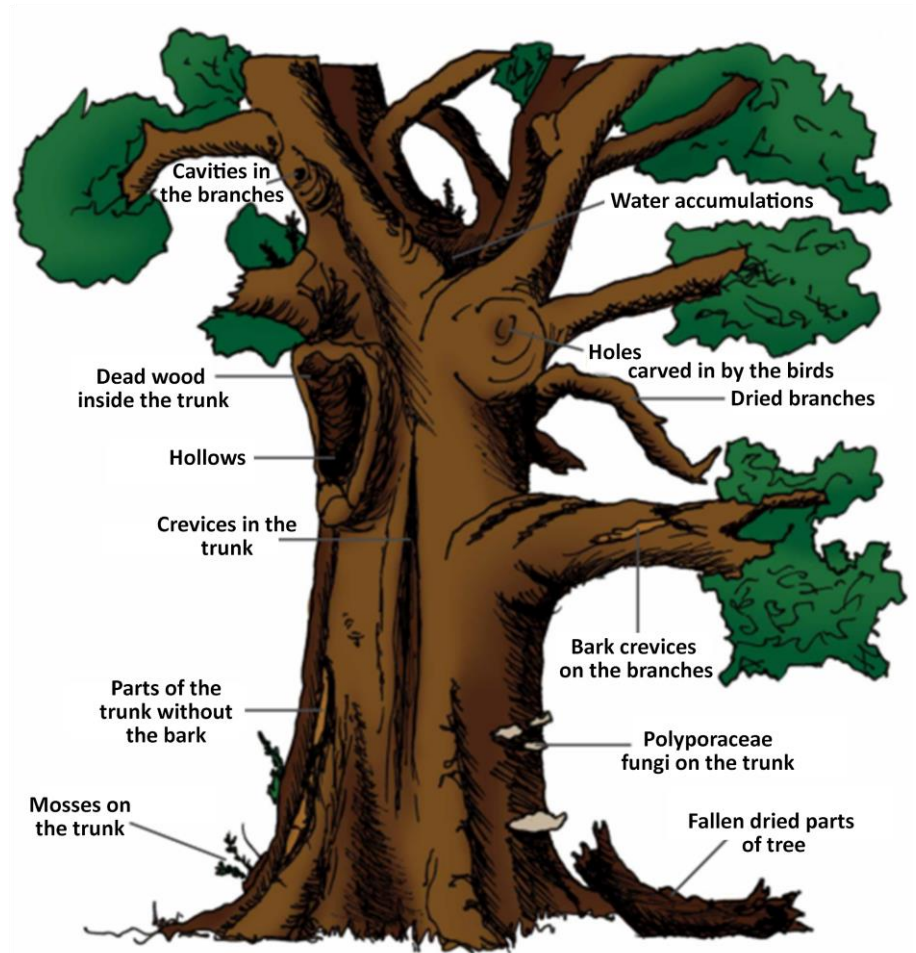
- A tree in a good condition and growing in a place which is little visited – no threat.
- A tree in a good condition and growing in a place which is much visited – no threat.
- A tree in a bad condition and growing in a place which is little visited - low threat.
- A tree in a poor condition and growing in a place which is much visited - high threat.

Importance for biological diversity. A factor which becomes relevant while assessing the trees from the point of view of nature in important city forests is the tree's benefit for nature. Threats of the trees, which are in a satisfactory or poor condition, but have a high natural value, should be reduced firstly by trying to preserve them, because a newly planted tree will perform the functions of the old one only partly.

Importance for biological diversity can be identified differently, however it is recommended to use the simplest scale – to establish the value of the tree according to its valuable elements (according to Read H., 2000, Fig. 1):

- Cavities in the branches,
- Dead wood inside the trunk,
- Dried branches,
- Fallen dried parts of tree,
- Hollows,
- Holes carved in by the birds,
- Crevices in the trunk,
- Bark crevices on the branches,
- Parts of the trunk without the bark,
- Water accumulations,
- Mosses and *Polyporaceae* fungi on the trunk

Fig. 1. Tree elements showing importance for biological diversity.



Having identified at least 4 elements, it is possible to state that the tree is valuable from the point of view of biological diversity, and the more elements are established the higher is the value of the tree.

Management of veteran trees

- While planning nature management works within territories, the biggest attention should be paid to the preservation of the most valuable trees.
- If a valuable tree is dangerous, first of all possibilities of the preservation by improving its condition should be evaluated (for example, by carrying out arborist activities), whereas elimination should be considered as the last resort.
- Management of veteran trees should go together with activities of informing.

Recommendations for leaving deadwood of different types

While leaving deadwood on the sites discussed in the guidelines, it is important to ensure safety of people, diversity of deadwood, aesthetic aspects of retention of deadwood and the right communication about actions of the site managers. Retention of deadwood should always go in parallel with society information actions discussed in the next chapter.

Types of deadwood. Diversity of wood can be defined differently, but in the context of these guidelines deadwood is divided into three types: dead and dried trees, snags and fallen trees.

Dead and dried tree is a dead standing tree with the preserved trunk and part of the crown. Left close to the paths, playing grounds or other intensively visited sites can cause danger to the safety of people.

Snag is remains of the standing old tree, most often being a part of the trunk with remains of several bigger branches. Left close to the paths, playing grounds or other intensively visited sites can cause danger to the safety of people, but cutting down of remaining branches or of the trunk can often allow safe standing for several decades.

Fallen tree is a fallen dead and dried tree or a snag. No hazard for visitors, but can have aesthetic considerations.

Site zoning. We offer to zone the sites in which deadwood will be left based on the same principle as in the cases of leaving veteran trees: high-use areas adjacent to official paths, other facilities and the rest areas in which visiting activities are less intensive. Distance forming 1.5 of the trunk length should be considered safe by official paths. For example, if a dead and dried 10 m tree is retained, distance from the closest path or another facility should be 15 m. Table 1 contains recommended retention by types and zones.

Table 1. Recommended retention of deadwood by type and site.

Type	Adjacent to paths or other facilities	Other sites
Dead and dried trees	-	Quantity required to achieve the set volume
Snags	Impressive size, causing no danger	Quantity required to achieve the set volume
Fallen trees	Large diameter, without branches or only with large branches	Quantity required to achieve the set volume

Quantity of left wood. In the ideal case, recommended volume of deadwood per hectare should be provided in a nature management plan. Nevertheless, in many cases sites have no nature management plans or recommended volumes of deadwood are not provided in them. In such cases, we offer to leave at least 10 m³ of deadwood per ha. This is half of the recommended quantity for the forests of our climate zone. If it is possible, similar proportions of all types of deadwood should be left.

While estimating the volume, one shouldn't forget that part of deadwood is related with veteran trees, i.e. with dried branches and wood which is inside the trunk. We may leave less in sites in which veteran trees,

dead dried trees, snags and fallen trees are abundant. Nevertheless, in order to have an even distribution of the types of deadwood, the priority while leaving wood on such sites should be given to snags and fallen trees.

Aesthetic and other important aspects of retention. The simplest way to accumulate a required quantity of deadwood while retaining a beautiful aesthetic picture of the site is to leave wood of large diameter. The volume of one tree trunk of a large diameter can be equal to the trunks of dozens of small trees, therefore in selecting what to remove you should start first of all from the smallest trees. While leaving wood at the paths and other facilities, it is important to do this aesthetically. Based on the examples of other countries, we offer the following:

- To leave only snags which, due to an impressive size or appearance, can be sites of attraction.
- To remove a bigger part of branches of the fallen trees while leaving only a trunk and several large branches. This way it will be possible to ensure a simpler access for visitors or haying.
- Branches can be taken away and, when the branches are left, it is important to avoid loading them on the trunk of the fallen tree.

Note:

1. Volume of wood is established by a nature management plan, if there is no any plan, it is recommended to leave at least 10 m³ of deadwood per ha;
2. Wood of large diameter is most important;
3. There should be equal quantities of dead dried trees, snags and fallen trees on the site;
4. Only fallen trees and impressive snags should be left by the paths;
5. All potentially dangerous dead dried trees and snags must be left at the distance equal to 1.5 of the length of the trunk from the paths or other visited facilities;
6. In managing the site, it is important not to load fallen trees with branches. They may be removed;
7. Deadwood is left and activities of public information are carried out alongside.

Communication strategy

City forests are excellent places for public education. By leaving veteran trees and deadwood on sites, forest managers can show their contribution in the field of environmental protection, as well as to inform the society on the importance of old trees and wood for the conservation of values of nature. Based on the example of other countries we propose to install big and small information stands providing information about implemented environmental measures.

No less important but neglected aspect of information in Lithuania is a need to inform visitors about dangers arising in windy weather conditions. In cases of windy (not typhonic) weather, forest managers in many countries ensure safety by the major paths only. For example, in the national parks of Germany this limit is from 15 m/s, if the wind is greater, visitors can walk in the forests only at their own risk. We don't doubt that at some time similar rules will be also adopted in Lithuania, but already now visitors are recommended to avoid more remote areas in windy weather.

We recommend to install information stands of several sizes in the city forests which are important from the point of view of nature:

- Large stands provide the following information:
 - role of veteran trees and deadwood in forests;
 - that park managers care about conservation of biological diversity;
 - how much, where and how deadwood and veteran trees are left;
 - risk of attendance in windy weather.
- We offer to use small stands in visited places:
 - On interesting veteran trees – telling a story why the tree is important historically or for nature.
 - On the fallen trees of large diameter – to show that they have been intentionally left and to inform about their value for forests.

Figure 2. Examples of stands.



