INSTITUT FÜR
BAUMPFLEGE
HAMBURG

WOOD-BIOLOGICAL INVESTIGATIONS ABOUT THE FELLED OAK TREE OXENSTIERNSGATAN, STOCKHOLM

Projekt-Nr. 41-12-01-08

25th April 2012

Inhaber und Leiter: Prof. Dr. Dirk Dujesiefken - von der Landwirtschaftskammer Schleswig-Holstein
öffentlich bestellter und vereidigter Sachverständiger für holzbiologische Baumanalysen, Baumpflege u. -sanierung

Institut für Baumpflege · Brookkehre 60 · 21029 Hamburg · Telefon: 040/724 13 1-0 · Telefax: 040/721 21 13
E-Mail: info@institut-fuer-baumpflege.de · www.institut-fuer-baumpflege.de · USt-IdNr.: DE177984970

INDEX

page

1. REASON AND PURPOSE OF THIS REPORT

Until the end of 2011 there was an oak in the road Oxenstiernsgatan in Stockholm. In the past there have been two investigation-reports on this tree, both of them coming to the result that the tree has not been safe anymore. Several rots had been found. Furthermore a weak vitality had been diagnosed. Both investigation-reports came to the conclusion that the tree had to be felled.

Some people, however, doubt the necessity of felling the oak. And even after the felling the necessity of this measure is still in doubt.

Aim of this report is to investigate by judging the provided photographs of the tree, the reports of 2011 and the still existing parts of the felled tree if the felling has urgently been necessary or if there had been an alternative for it.

2. CLIENT

This wood-biological investigation and report have been ordered by

Trafikkontoret
Park och Stadsmiljö
Fleminggatan 4
10420 Stockholm

This investigation-report has been given the Projekt-Nr. 41-12-01-08.

3. DATE OF INVESTIGATION AND PROVIDED DATA

The investigation has been taken out by Prof. Dr. Dirk Dujesiefken of the Institut für Baumpflege Hamburg (Institute for Arboriculture) on 12th March 2012.

Before starting the investigation there had been a meeting at the Trafikkontoret Stockholm. Thereafter the stump of the oak in Oxenstiernsgatan has been examined. Then the still existing parts of the stem and crown of the tree which are stored in the Hagapark have been examined as well.

The following data have been provided for this investigation:

- investigation-report of Arbor Konsult AB Stockholm, Anders Ohlsson Sjöberg of 08th July 2011
- investigation-report of Erik Solfjeld, Oslo of 22nd November 2011
- collection of photographs by Björn Embrén, Trafikkontoret, Stadsmiljö / Park och Stadsmiljö Stockholm with pictures of the oak before and after felling

4. APPLIED METHODS OF INVESTIGATION

The vitality of the tree has been judged by looking at the photographs applying the criteria of the monitoring and analysis of the effects of air pollution on forests in the EU as well as the following literature:

ROLOFF, A.; Baumkronen. Verständnis und praktische Bedeutung eines komplexen Naturphänomens; Verlag Eugen Ulmer, Stuttgart, 165 S.

Judgement of the state of the tree as a whole and especially of the wounds, damages and symptoms of injuries is based on the provided photographs, the description in the investigation-reports and as well the wooden parts of the oak

which had been safely stored. It is based on the international commonly applied criteria basing on the following literature:

BAUMGARTEN, H., DOOBE, G., DUJESIEFKEN, D., JASKULA, P., KOWOL, T. WOHLERS, A., 2009: Kommunale Baumkontrolle zur Verkehrssicherheit. Der Leitfaden für den Baumkontrolleur auf der Basis der Hamburger Baumkontrolle. 2. durchgesehene Auflage, Haymarket Media, Braunschweig, 128 S.

BUTIN, H., 2011: Krankheiten der Wald- und Parkbäume. 4., neubearbeitete und erweiterte Auflage, Ulmer Verlag, Stuttgart, 319 S.

DUJESIEFKEN, D.; JASKULA, P.; KOWOL, T.; WOHLERS, A., 2007: Baumkontrolle unter Berücksichtigung der Baumart. 2. Auflage, Verlag Haymarket Media, Braunschweig, 296 S.

DUJESIEFKEN, D.; LIESE , W., 2008: Das CODIT-Prinzip – Von den Bäumen lernen für eine fachgerechte Baumpflege. Verlag Haymarket Media, Braunschweig, 159 S.

LICHTENAUER, A.; KOWOL, T.; DUJESIEFKEN, D., 2008: Pilze bei der Baumkontrolle. Erkennen wichtiger Arten an Straßen- und Parkbäumen. 2. überarb. Aufl. 2003, 3. durchgesehene Auflage 2008, Verlag Haymarket Media, Braunschweig, 64 S.

LONSDALE, D., 1999: Principles of Tree Hazard Assessment and Management. Research for Amenity Trees No. 7, Forestry Commission, 388 p.

MATHENY, N. P.; CLARK, J. R., 1994: A Photographic Guide to the Evaluation of Hazard Tress in Urban Areas. Second Edition, Int. Soc. of Arboric., Savoy, Illinois, USA, 85 p.

MATTHECK, C.; BRELOER, H., 1994: The body language of trees. Research for Amenity Trees No. 4, 240 p.

SCHWARZE, F.W.M.R.; ENGELS, J.; MATTHECK, C., 1999: Holzzersetzende Pilze in Bäumen. Rombach Verlag. 245 S.

SHIGO, A. L., 1986: A New Tree Biology. Shigo and Trees Ass., Durham, NH/USA, 595 p.

WESSOLLY, L.; ERB, M., 1998: Handbuch der Baumstatik und Baumkontrolle. Patzer Verlag Berlin, 270 S.

Richtlinien für Regelkontrollen zur Überprüfung der Verkehrssicherheit von Bäumen – Baumkontrollrichtlinien (2010). Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e. V. (FLL), Bonn, 53 S.

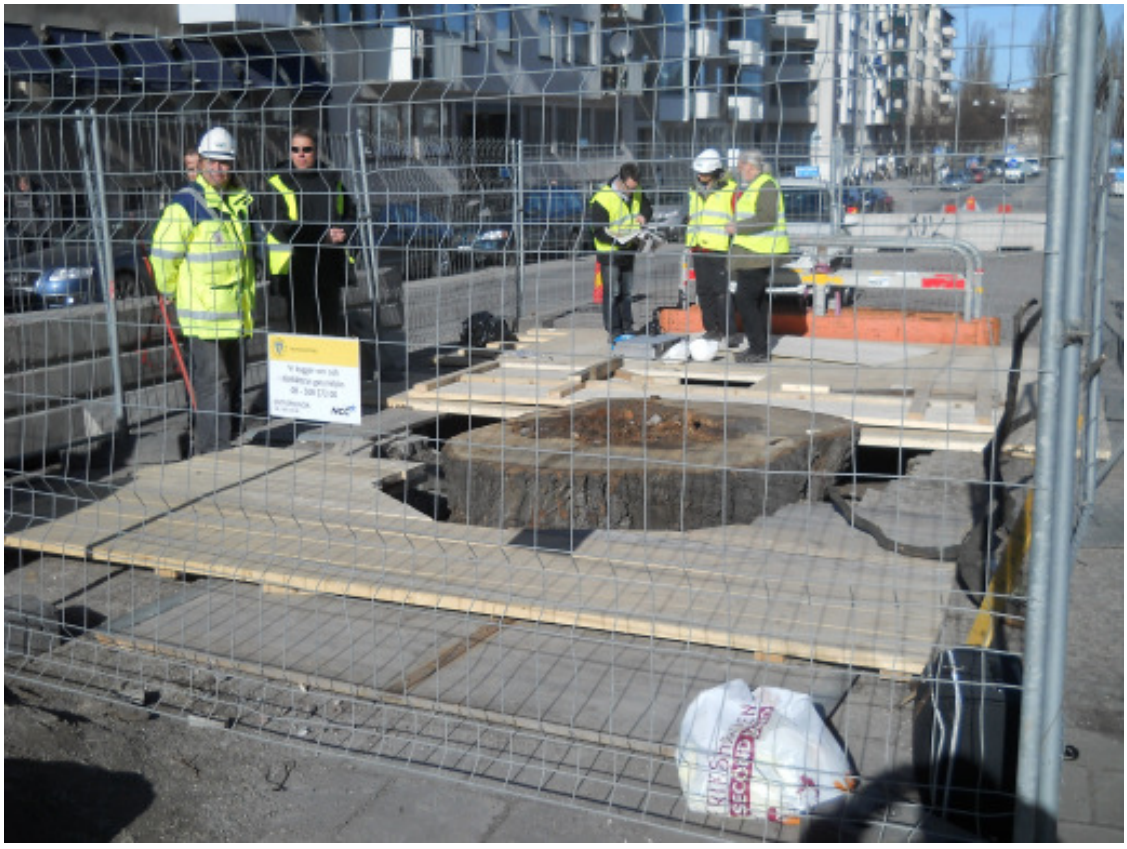
5. RESULTS

The tree to be examined was an English Oak (*Quercus robur*) located on a small spot of green in the middle of the lanes of a very busy street (pic. 1). It was an extremely disadvantageous location for a tree. During the last decades there had obviously been severe changes in the location around the tree. Excavations on the spot after the felling showed that the tree had been filled in by at least 3 m over the last decades. In the important part of the root zone there was obviously strong soil compaction and the surface was sealed for road construction. These were considerable changes for the location and the oak. Trees in general, even if they are much younger than the oak, are not able to survive such negative changes in the root zone.

The massive filling and sealing of the surroundings of the tree and especially of the root zone has also been the most important reason for the declining of the crown. Massive filling and sealing of the surface cause a lack of oxygen in the soil. Furthermore the water supply of the tree is explicitly reduced or disturbed. These negative changes in the soil lead to dying roots and later on to decay. Because of the dying roots the uptake of nutrients is no longer guaranteed. Therefore the crown declines.

One of the former five stems had died back already many years ago and had to be cut off. Another stem died in 2011. That means that 40 % of the crown already had been dead in 2011. The remaining part of the crown has to be considered as severely damaged respectively declined.

The main reasons for the poor vitality of the tree and for the declining of the crown therefore are the road construction work which took place in the 1960es as stated by the client (Trafikkontoret Stockholm).



Picture 1 The stem base of the oak in Oxenstiernsgatan, a very busy street

A tree with a poor vitality and few leaves is not necessarily a tree which is not safe anymore. This is the reason why the examination of the wood is important. Having a close look at the stem base and the lower stem in Oxenstiernsgatan showed that the tree had had to suffer a lot of injuries over the last decades (pic. 2). For the examination the lower stem and stem base have been partially exposed. This made obvious that a significant part of the stem base had already been dead (pic. 3).

Starting at the various wounds extensive decay has spread inside the stem (pic. 4). It is mainly a brown rot in the heartwood. In the wounded areas also the sapwood was dead and a white rot has been established. The thickness of remaining healthy wood in the stem was in parts less than 10 cm (pic. 5).

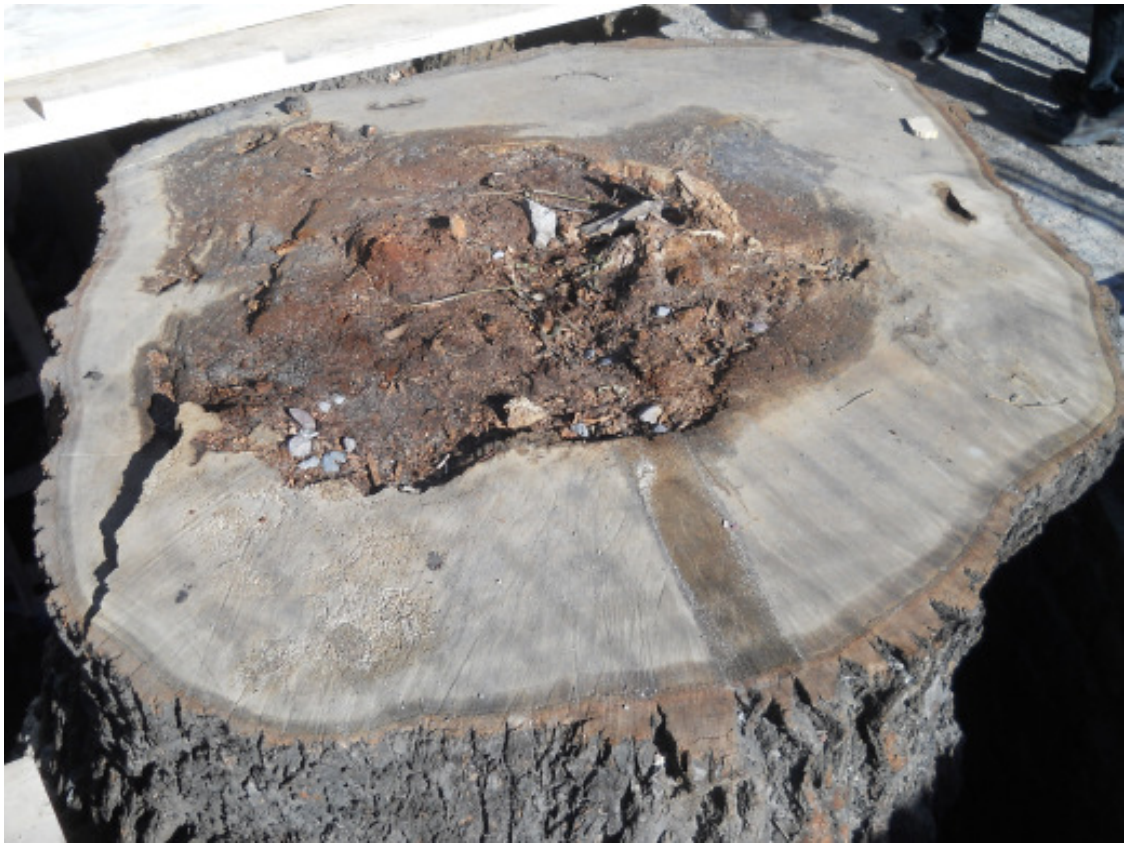
Examination of the stems and branches showed that the oak also showed extensive decay in most parts of the crown (pic. 6 - 12). It was striking that the stem that died in 2011 did not really have noticeable decay (pic. 13) whereas the stems that still had leafs all showed extensive decay. This result also shows that you cannot judge the safety of a tree by its foliage. Even vital branches with a lot of leafs can show severe damages inside.

The damages in parts of the crown are more extensive than in the stem. There were several areas where the bark and the sapwood of the branches of the crown had died back. This means that the remaining thickness of healthy wood was 0 cm. In areas of older wounds in parts even the callus was dead (see pic. 6 – 12).

The summarized conclusion is that not only the tree as a whole had been dying back but also that there had been extensive decay in the stem base, the stem as well as the crown. Therefore the tree was no longer safe.

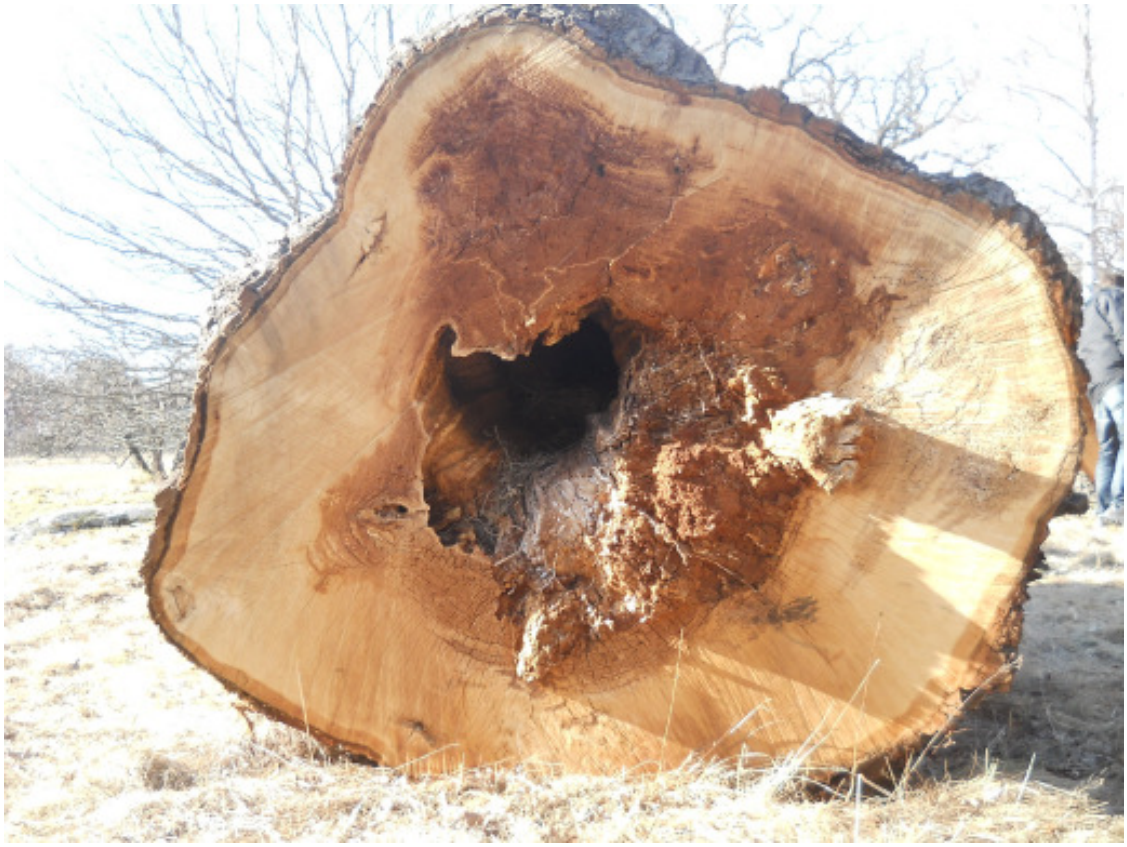
Picture 2 Many old wounds on the stem base

Picture 3 Big old wound with decay at the stem base 3 m deep under the road

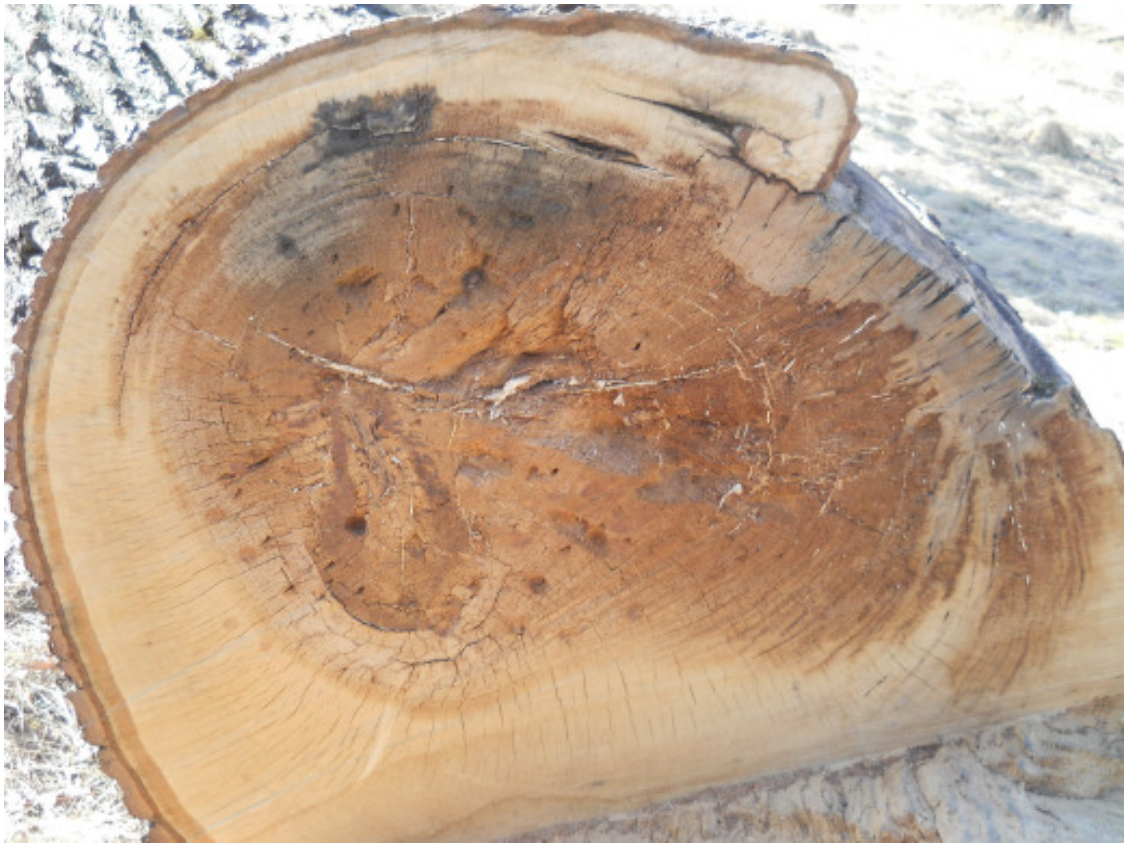


Picture 4 Extensive decay (brown rot) in the stem

Picture 5 The thickness of sound healthy wood is in parts less than 10 cm



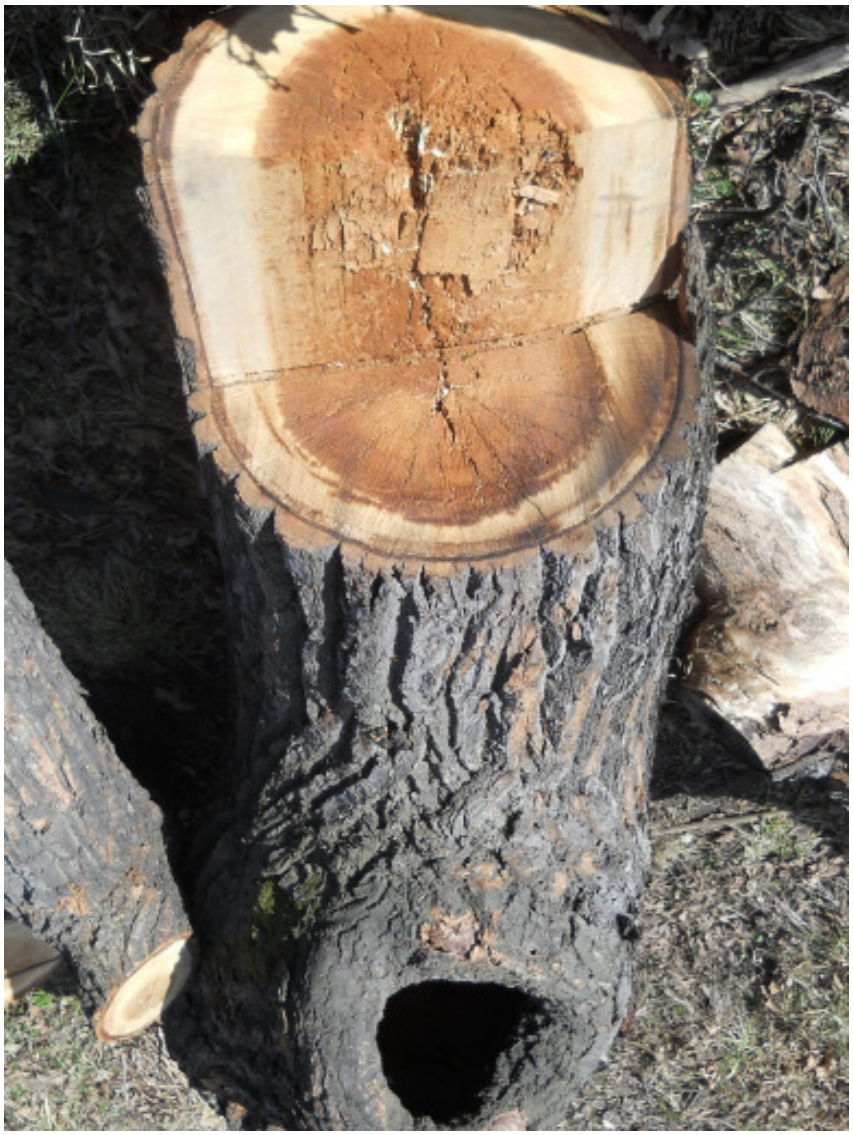
Picture 6 Decay in the upper stem of the oak



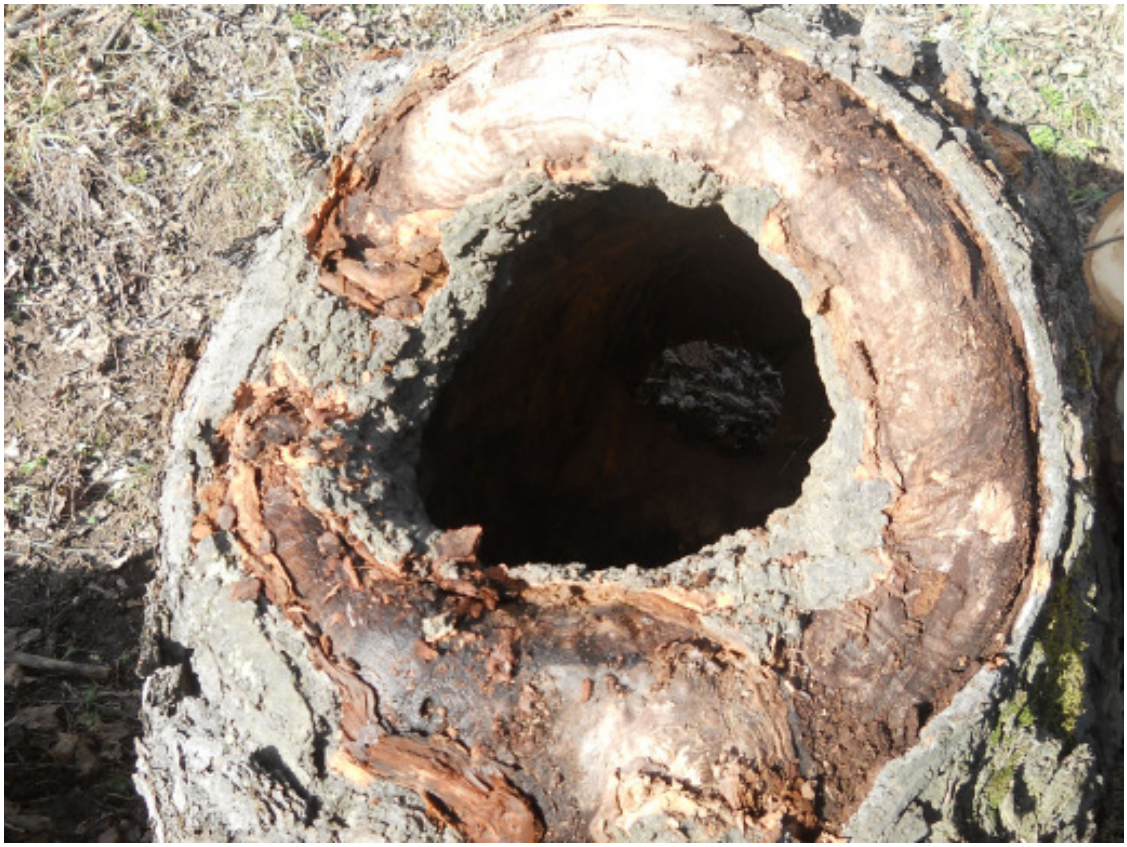
Picture 7 Great amount of decay also in the crown

Picture 8 Massive brown rot in another stem in the crown

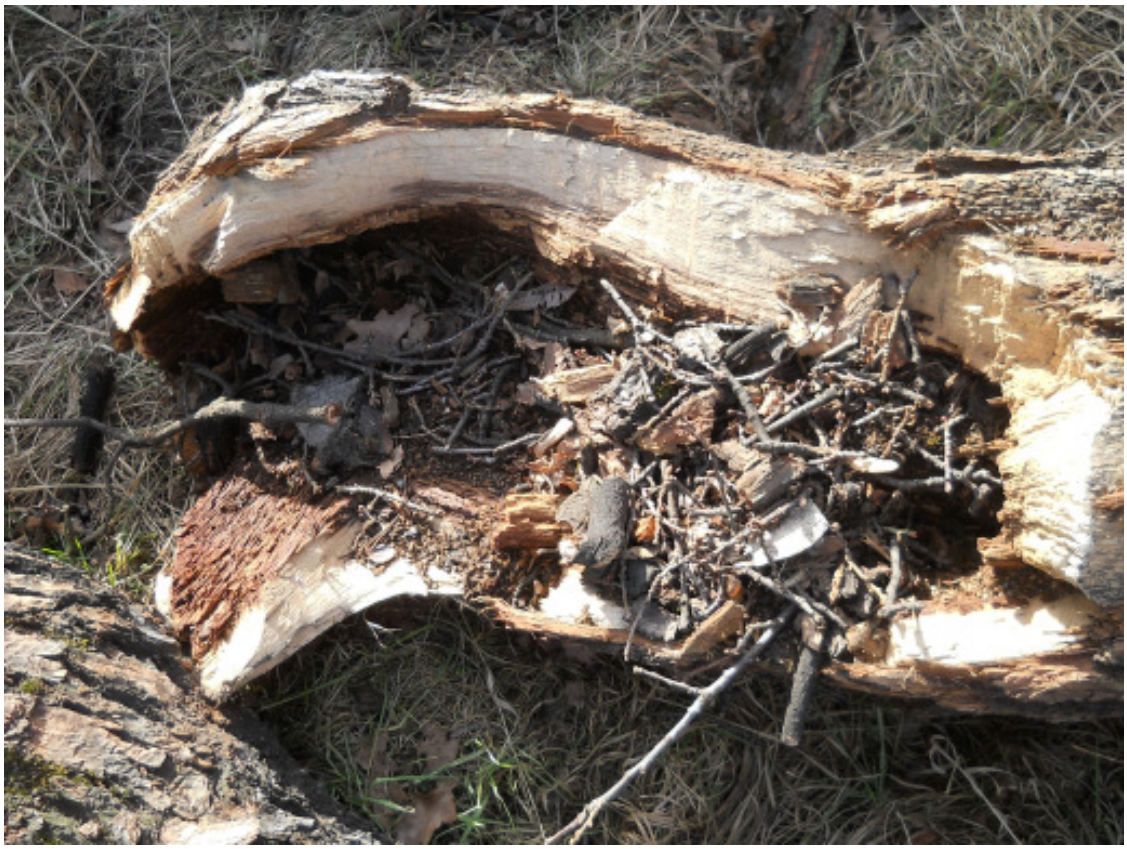
Picture 9 Big wounds and decay in the crown



Picture 10 Brown rot in another stem



Picture 11 Dead callus of an old wound



Picture 12 Hollow stem in the upper crown

Picture 13 The dead stem without any brown rot inside

6. CONSEQUENCES

Trees with such extensive damages do not necessarily have to be felled. There are in principle three possibilities of further handling such trees. Each of these possibilities has to be checked case by case:

1. Installation of a crown securing system

There had already been crown securing systems installed in the tree. These crown securing systems did not function anymore because the fourth stem died back. The problem with the oak was that all of the three remaining stems had extensive decay inside. There was no healthy stem left to fix a crown securing system which would have been able to protect the damaged stems. This was the reason why the installation of a crown securing system was not possible anymore.

2. Reducing cut of the crown

When there is extensive decay in the wood of a tree a reducing cut is a commonly applied tree care measure. The crown becomes smaller and the load working on it is reduced. The precondition for such a measure is that the roots, the stem base, the stem as well as the main fork are strong enough to hold the smaller crown and that the crown is able to build new shoots to form a secondary crown. The oak on Oxenstiernsgatan did only show very few new shoots (water sprouts) although there had been strong cut backs in the lower and inner crown. That was a sign that this tree did not have the possibility of regeneration. A crown reduction cut would have taken a mayor part out of the tree's crown without a real chance for a new (secondary) crown. Therefore this measure would not be appropriate for a preservation of the oak as well.

3. Felling of the tree

In case tree care measures for safety reasons or to ensure a long-term preservation of the tree are not possible anymore the only alternative is the felling of the tree. In this specific case, because of the severe damages of the tree, both methods were not possible or did not lead to a successful preservation. Thus the only consequence had been felling the oak.

Without any doubt the oak in Oxenstiernsgatan had been a very old and special tree which characterized its surrounding. The history of this tree showed that the construction work on the location affected the oak extremely. Without these extensive construction measures within the root zone this tree would possibly have had a much longer life expectancy. This case shows that precautious tree protection during construction is of immense importance. Professional tree protection on construction sites therefore is the best environmental protection.

Hamburg, 25th April 2012

Prof. Dr. Dirk Dujesiefken
Institut für Baumpflege