

Appendix 1 – ESCC Dutch Elm Disease Strategy (2017)

Background

In 2012 ETE Scrutiny Committee carried out a review of the Dutch Elm Disease (DED) sanitation programme to decide whether to continue or stop the programme. The recommendation was to maintain the programme, as long as it continues to:

- 1) ensure the long-term survival of a significant population of mature English elm, as this population makes an important contribution to the local landscape, provides a habitat to a number of threatened species, and is considered by Natural England to be of regional importance.
- 2) Assist in managing the health & safety risk of DED on the highway and in schools;
- 3) Be delivered in the most cost effective way.

This strategy was developed in 2013 to set out how these objectives are being met. ETE Scrutiny Committee reviewed a progress report against this strategy in March 2015. This is a further review of progress between 2012-16 against the objectives of the strategy.

What is DED and how can it be managed?

DED is estimated to have killed approximately 25 million elms in the UK since the late 1960s. ESCC established a DED control programme in 1971. The South Downs Joint Committee managed the programme for the area between Brighton and Eastbourne for most of its existence, on behalf of ESCC. ESCC subsequently took over the delivery of the programme from April 2011 when the South Downs National Park Authority came into being.

The East Sussex DED control zone holds the world's largest known population of English elm. Together with other varieties of elm, it's estimated that the total population of mature trees in East Sussex in 2016 was approximately 16,000, which is about 2% of the total number of trees found outside woodland in East Sussex.

Elm trees are concentrated in particular areas, notably the coastal towns and relatively low-lying clay soils behind the Downs and along the valleys running through the Downs, due to factors such as soil and climate. Consequently, whilst the total number of Elm trees is relatively small, they often make up a significant percentage of the tree species within the areas in which they are found. Elms have survived in these areas due to natural protection from the sea and the Downs and as a result of the DED control programme.

DED is caused by a fungus which is transmitted from tree to tree by two types of elm bark beetle, or via interconnecting roots between two or more trees. The fungus causes elms to block their own water conduction system in an attempt to cut off the spread of infection, resulting in wilting and death of the foliage and the slow death of infected limbs. Symptoms first appear in early spring/early summer (depending on

the weather) and last until the trees shed their leaves in the autumn. The beetles tend to move between trees when the temperature is between 16-20°C, hence the spring-autumn period has tended to be the operational DED 'season'. Trees that are suitable for beetles to breed in need to be of a suitable size (about 15 years old) and condition.

Currently, there are no means to eradicate DED which means that a programme to manage the spread of DED is an open-ended financial commitment. The most effective means of containing the disease is through a combination of methods to minimise the beetle population. The main action is to fell infected trees, or parts of trees, and burn these to prevent further spread of the disease. Trunk girdling can also prevent the spread of the disease via the roots, and a new vaccine has been developed which is believed to protect elms from the fungus.

The DED Order 1984 empowers, but does not require, Local Authorities to serve notice on owners of diseased trees, to fell them and dispose of them appropriately. Should this not happen in the time period advised, the Order permits an appropriate officer to serve notice, to enter private land and to organise felling or other work necessary to control the spread of DED, with the costs recoverable from the landowner. ESCC has not yet chosen to invoke this Order.

What is the best way to manage DED?

In 2012/13 ESCC worked with DEFRA's Food and Environment Research Agency (FERA) and the Department of Plant Sciences at the University of Cambridge to compare whether the objectives set out above are best met by stopping or continuing the DED sanitation programme. The modelling report produced by the University of Cambridge is included as Appendix 1. It concludes that:

- 1) the sanitation programme would enable a larger population of healthy elm trees to survive;
- 2) the cost of the sanitation programme should gradually reduce as the spread of DED becomes more contained.

This conclusion was accepted by Scrutiny Committee in March 2013. The progress report to Scrutiny in March 2015 indicated that the number of trees that were being felled each year reduced between 2012-14. This further update report shows that the number of trees felled between 2014-16 has reduced further. This has enabled an 11% cut in the DED budget between 2012-16. Table 1, and figures 1 and 2 below, provide a comparison between what has happened in practice between 2012-16, what was modelled by the University of Cambridge, and what was estimated would happen if the sanitation programme was stopped.

Table 1 compares the costs and effectiveness, over a 10 year and a 25 year period since 2012, of:

- 1) stopping the sanitation programme, which would lead to the rapid spread of DED and the need to fell diseased trees on the highway and ESCC land for perhaps 7 years (estimated by the model produced by the University of Cambridge);

- 2) the number of trees that would need to be felled, and the associated costs, if the spread of DED occurred in the manner predicted by the Cambridge model;
- 3) the actual number of trees felled and the associated costs to date (ie. between 2012-16) and an extrapolation of these figures over the remaining 20 years (ie. from 2017 to 2037).

Table 1.

Approach	Healthy elm population after 10 years	Healthy elm population after 25 years	Number of elms felled in 10 years	Number of elms felled in 25 years	Cost of control 10 years	Cost of control 25 years
No control	7000	6000	5210	5210	£1,228,000	£1,228,000
Model predictions	14000	14500	6500	16250	£705,800	£1,764,500
Actual & forecast	14000	14500	8150	9520	£814,900	£1,318,500

These figures are based on similar assumptions to those included in the reports to Scrutiny in 2013 and 2015, to ensure consistency over time. The key assumptions are:

- 1) the percentage split between where diseased trees are located, which dictates most of the costs (ie. 6.5% of diseased trees are street trees, 16% are on the highway, 3% are on ESCC's estate and 74.5% are on private land);
- 2) the costs to the County Council of felling diseased trees (ie. £420 per street tree, £60 per tree on the highway and ESCC estate, and £33 per tree on private land). The much higher cost for street trees is mainly because of the need to grub out stumps, as well as the additional health & safety requirements for working on the highway.

The main conclusions from table 1 are that:

- 1) stopping the sanitation programme is more costly over the short and medium term than continuing the programme, because stopping the programme would lead to the rapid spread of DED and, therefore, the need to fell large number of diseased trees on the highway and on ESCC land for perhaps 7 years to manage the Health & Safety risk;
- 2) continuing the sanitation programme becomes more expensive than stopping it over the longer term, because it's an open-ended financial commitment as DED currently cannot be eradicated;
- 3) continuing the sanitation programme enables a larger population of healthy mature elm trees to survive than stopping the programme because fewer trees would become infected.

Therefore, continuing the sanitation programme would meet two of the main objectives of the DED programme more effectively than if the programme is stopped.

Figure 1 provides a visual comparison of the number of trees:

- 1) felled in practice between 2012-16 and forecast to be felled over the next 20 years ('actual and forecast');
- 2) that were predicted that would need to be felled by the Cambridge model ('expon. (model)').

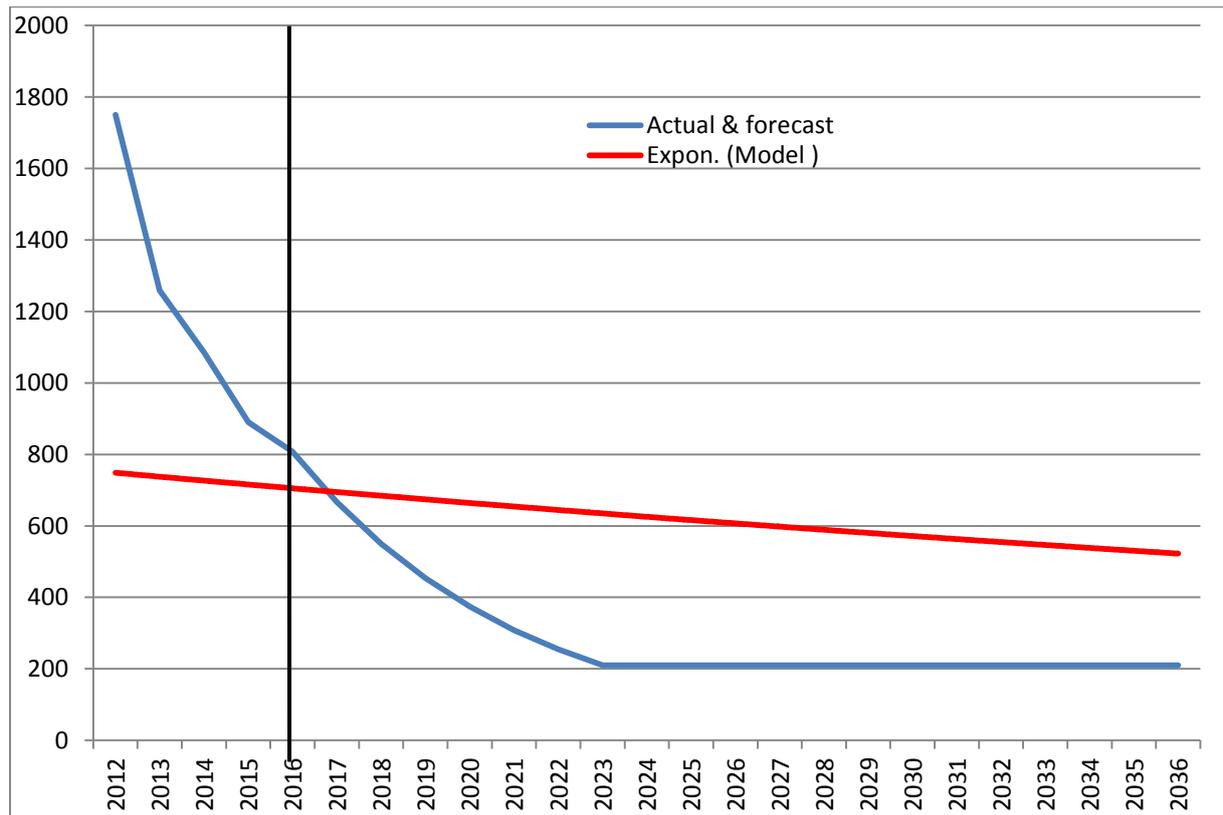


Figure 1.

The black line shows where we are in 2016. The main conclusion from figure 1 is that there has been a large reduction every year for the last 4 years in the actual number of trees that have become infected and have been felled, which is broadly in line with the conclusion from the Cambridge model.

The main assumptions underlying figure 1 are that:

- 1) the number of trees that will need to be felled in practice will continue to reduce for about a further 5 years, though the rate of reduction will gradually slow down;
- 2) we will reach a more stable level of felling, which is guesstimated at about 1.5% of the total health elm population. This is based on the long-term experience of the sanitation programme in Amsterdam, where approximately

0.5% of the total population is felled every year. A higher percentage has been assumed for East Sussex because it's more difficult to manage DED in a rural area where most of the elm trees are on private land.

It is important to note that there is considerable uncertainty with forecasting the effectiveness of the DED sanitation programme. This is because the rate of spread of infection is not yet well understood, which means that the Cambridge model includes a number of simplifying, and possibly inaccurate, assumptions. In addition, there are a number of other variables that we cannot take into account, for example the effect of climate change and water stress, or the predicted effects of other tree diseases. Consequently, whilst independent experts in the field (eg. the Forestry Commission) conclude that the sanitation programme is based on the most up-to-date knowledge of DED and is the best approach to managing DED, the figures used in this report should be taken as an indication of the direction of travel rather than firm estimates of what will happen in future.

The vaccination programme

In 2016 funding from the Conservation Foundation enabled ESCC to trial a DED vaccine used in Amsterdam and parts of the USA. The vaccine was cleared for use in the UK in early 2016 and appears to have a 99% success rate. Due to the late availability of the vaccine, it was trialled on several street elms in Seaford, all of which have survived to date in an area where DED is prevalent. In spring 2017 ESCC will trial the vaccine in Eastbourne, where there are a number of street elm trees. As with all vaccines, it works by triggering an immune response in the tree, which lasts one season. Should the tree become infected with DED, the immune response to the fungi is much faster, causing it to be trapped within the infected limb rather than being able to spread through the entire tree, which kills the tree. A cost analysis will be carried out to see whether vaccinating the street elms of Eastbourne and carrying out remedial pruning each year is more cost effective than felling and removing mature diseased elms each year.

The DED control strategy 2017 onwards

1. The key objective of the sanitation programme will continue to be the reduction of the beetle population by continuing to fell trees with beetles in them within the existing control zone. This will entail:

1) Removing trees containing grubs (brood trees) or in condition to contain grubs (host trees).

2) Using host trees spotted late in the season as trap trees, which will be felled during colder weather.

2. Costs: the cost of the programme will continue to be assessed every year and reduced incrementally, at appropriate stages. This will include reducing the current full time DED Officer role to a part time role, to reflect the reduction in the number of trees felled, balanced against the additional time that may be required if the vaccination programme proves successful. The contribution of 75% of the felling

costs by private landowners when trees are on their land will continue, as will efforts to secure further external funding contributions.

3. The control zone: elm trees on the periphery of the control zone will be inspected to avoid 'flare-ups' within the control zone. This may entail felling trees that pose a significant threat to important areas on the edge of the control zone.

3. Contractors:

- 1) We will continue to use a number of local and/or regional contractors, procured in accordance with Standing Orders to ensure value for money, to ensure continuous work can occur across the control zone.
- 2) Contractors work is monitored routinely, including burn sites/yards to ensure that they are not increasing the risk of spreading DED. Currently 6 contractors have yards within the control zone.

4. Felling process:

- 1) Prioritise the felling of trees:
 - a. currently being used as a beetle breeding habitat within the shortest period of time possible.
 - b. able to be used as a breeding or over-wintering habitat during that season within the shortest period of time possible (unless trees can be used as 'trap trees' (i.e. to 'trap' breeding beetles).
 - c. depending on the risk they pose, for instance in reducing the risk of infection to healthy Elm populations in Eastbourne and Brighton & Hove.
- 2) Assess any site risks before work is commissioned and monitor hazards (e.g. before and after photos, photos of buildings or other risks, check contractors risk assessments).

5. Surveying and mapping: continue to survey and map trees between the B2124 and A27 to decide if boundary readjustment is necessary.

6. Communications:

- 1) actively promote the control programme through the media through press releases linked to key messages.
- 2) Engender a sense of personal and community responsibility and encourage residents and staff to get involved with protecting the elm population of East Sussex by:
 - a. Promoting the ESCC DED webpage and Facebook page;
 - b. Promoting the Highways contact centre;
 - c. Using the intranet and departmental newsletters;
 - d. supporting Parish Tree Wardens.
- 3) Key spokespeople:
 - a. East Sussex County Council Lead Cabinet Member for Transport and Environment, for messages relating to policy.
 - b. DED Officer, for technical messages.

7. Partnership working:

- 1) Work with ESCC's external funding team to seek additional funding for sanitation and replacement planting.

2) Work closely with the South Downs National Park Authority, for assistance regarding the use of volunteers and staff, and potential sources of funding. Work closely with key landowning organisations and individuals (eg. the National Trust, Firle Estate). 4) Work in partnership with BHCC and Eastbourne BC (eg. on the vaccination programme).

8. Monitoring & reporting:

- 1) Maintain the existing database with information on each infection site (e.g. land owner name, address, number of trees, quotes, etc).
- 2) Continually assess and monitor the work of contractors throughout season. Provide a brief annual report on progress on implementing this strategy, covering:
 - a. Numbers of trees felled and at what cost;
 - b. Changes in the total elm population;
 - c. Review of the assumptions made above, to incorporate relevant new evidence;
 - d. comparison with the Cambridge model.

9. Other tree diseases:

- 1) Continue to work with Kent County Council's Ash Die-Back Strategic Coordinating Group.
- 2) Update ESCC departments with strategic policies formed by DEFRA.
- 3) Acute Oak Decline and Sudden Oak Death are not prevalent in East Sussex but are being managed further north (Suffolk, Norfolk, Midlands).

10. Key risks:

Risk	Potential impact	Measure to address risks
Beetle population increases as elm population increases.	A larger beetle population will increase the amount of infection.	The prioritised approach aims to reduce elms that are host or brood trees.
Length of season increases (eg. due to climate change).	Earlier springs and later autumns could increase the number of beetle breeding cycles, increasing the beetle population and subsequent spread of infection.	Ensure adequate budget to clear all priority trees, to manage beetle numbers.
Disease spread by storing and transporting diseased wood.	Unknown beetle breeding sites cause unpredictable 'flare ups', by storing brood wood or transporting brood wood from areas of high infection to areas of low infection. Increases costs.	Monitoring of burn sites & wood yards. Awareness-raising amongst contractors, key landowners and the public.

11. Replanting: a pilot replanting scheme was carried out in 2015 using elm that may be disease-resistant. Their progress will be monitored to determine its effectiveness before deciding whether to allocate any budget to re-planting.