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‘I’d like to report a suspicious looking tree’: public concern, public attention and the nature of reporting about ash dieback in the UK

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ABSTRACT

‘Public concern’, a ubiquitous notion used in descriptive and explanatory modes by policymakers, academics, and the media, is often presented as axiomatic. However, the variability with which it is deployed in different contexts, e.g. as justification for policy attention or having equivalence with what is considered ‘newsworthy’, belies this status. This paper presents an empirical analysis of emails and phone calls from the UK public, to UK government agencies, reporting suspected cases of ash dieback disease; a tree health issue which attracted intense media and policy attention in the UK in 2012. We challenge the view that public attentiveness is necessarily indicative of public concern, or that media attention can be taken as its proxy. Examination of concern at macro and micro levels reveals heterogeneous processes with multiple dimensions. Understanding the nature of public concern is crucial in enabling more effective policy development and operational responses to risk related issues.

public concern, helplines, tree health, publics, risk

Policy makers are increasingly confronted with claims of public concern over diverse issues ranging from zoonotic diseases to environmental degradation (Aasen, 2017; Rickard et al., 2013). Historically, what constitute matters of public concern is difficult to characterise (Calvert, 2012), although a tension between private/personal and public/social concerns was evident, e.g. in the indeterminacy of '…the Bound that divides the personal from the public Province…' (ibid. 23). Hence, the status of what was deemed 'public concern' was inseparable from 'individual' concerns. Whether this remains the case is relevant when considering the relationship between publics and organisations seeking to manage specific issues of potential concern.

This paper unfolds as follows. We begin by outlining some of the key issues with regards how the public have been thought about, the conceptual and methodological challenges associated with 'measuring' public concern, and suggest the value of differentiating between 'concern' and its synonyms, in terms of affect and perceptual processes. Next, we describe the key features of the 'ash dieback crisis; a tree health issue which attracted intense media and policy attention in the UK in 2012. This sets the stage for an explanation of the curation and analysis of data comprising emails and phone calls from the UK public, to UK government agencies, reporting suspected cases of ash dieback disease. We challenge the view that public attentiveness is necessarily indicative of public concern, or that media attention can be taken as its proxy. In the conclusion, we suggest that understanding the nature of public concern is crucial in enabling more effective policy development and operational responses to risk related issues.

1. Introduction

Imagining and invoking publics can legitimise policy decisions and actions (Mcdermont, 2013), the inherent politicisation of which points to the contingency of 'publicness', as different people, places and events are brought together (Newman and Clarke, 2009). A notional public is called into existence when the contingencies of events impinge on collective consciousness such that the citizenry recognise a common need to mitigate their circumstances (Dewey and Rogers, 2012). A tension between the individual and the collective is apparent in that the former may diverge from wider public norms in relation to any particular concern. Hence, in conceptualising concern, it is important that the particularity of individual perspectives can be discerned alongside representations of public concern at the social level.

Public concern has been measured in a variety of ways. One methodological dilemma is whether measuring concern produces it. Likert-type survey response options, for example, may overestimate risks because the nature of questioning can prime the respondent with regard awareness of an issue, even if none existed before (Gaskell et al., 2017). What is being 'captured' empirically, e.g. existing concern, prompted concern or mere salience is unclear. Notwithstanding this, in academic literature and policy documents, public concern tends to be presented as self evident, and yet its deployment in different contexts, e.g. as a justification for policy attention or having equivalence with what is considered newsworthy (Fellenor et al., in press-b) suggests much greater complexity.

In terms of how issues come to public attention, the traditional media have characteristically played a key role as 'gatekeepers' with 'absolute authority' over selecting which messages get communicated to the public (McGrath, 1995). Gatekeeping can be viewed as a process whereby the media are themselves political actors (McNair, 2017) constructing 'social reality' and shaping publics (Shoemaker et al., 2001). However, the manner in which media effects are conceptualised, e.g. agenda setting (Kingdon, 2013), and their relationship to constructions of reality and the policymaking process is increasingly complicated by the ubiquity of social media and the manner in which journalists call upon it (Fellenor et al., 2017). In turn, this complicates the notion of a non-specialist [mass] public that has been moved to engage with an issue ex nihilo, and problematises existing notions of traditional media hegemony with regard to shaping publics. It cannot be assumed that media attention to an issue, or indeed its lack, reflects uniform public concern in any simplistic manner. Thus, it is important to consider the extent to which the nature of public attentiveness accords with media representations of an issue.

As a noun, 'concern' is synonymous with 'anxiety', 'worry', 'disquiet' and so forth. Intuitively, words such as 'sad', 'worry', 'upset' and 'distress' are mutually related (Wierzbicka, 1992). In this usage, synonyms for concern are used to convey negative affect; i.e. feelings expressing a negative evaluation of a situation. Hoyer et al. (2009) note that 'worry' and terms such as 'rumination' are often used interchangeably by laypersons, while even expert definitions highlight overlapping features. However, concern also denotes 'matters of interest or involvement', which do not necessarily imply an affective correlate. This complicates interpreting what is meant by someone expressing they are 'concerned'. Levy and Guttman (1985) explored the relationship between 'concern', 'worry' and 'fear' operationalising

'concern' as involvement with an issue, and differentiating between these terms with respect to their affective content. Whether such nuances relate to the routine deployment of the term remains moot; certainly there is no simple one to one correspondence between terms at the semantic and affective levels. Moreover, to define a term while avoiding circularity requires a stable and absolute referent (Wierzbicka, 1992), and this is problematic when it comes to affect.

Sjöberg (1998) suggests that there exists no strong relation between worry and risk perception; worry involves an emotional component that cannot be understood in the same way as the intellectual [cognitive] appraisal of a risk. In their longitudinal study of the relationship between perceived risk, worry, and emotional distress, Kobbeltved et al. (2005) suggest the causal relation moves from risk perception to worry and emotional distress but that risk perception does not change as a function of worry. In some cases, concerns/worries may not be articulated at all, instead remaining unexpressed or implied (Floyd et al., 2005). Nonetheless, people accomplish things through language and we have to assume that when people convey feelings or perecptions to an object, using 'concern' and its synonyms, there is enough linguistic stability within a culture to draw functional conclusions about how people orientate to that object.

One practice which provides a lens through which to examine public concern involves individuals contacting organisations and policymakers about various issues (Reddick, 2005). Contacts from the public may provide an opportunity to explore the positions taken with regard to an issue, and their relation to concern, and may be used to inform decision making (Oostveen, 2010). An issue that witnessed intense media attention and attributions of public concern, from the forest sector, researchers and policymakers, was the emergence in the UK in 2012 of ash dieback disease (*Hymenoscyphus fraxineus*).

The ash dieback crisis

Ash dieback disease (dieback) is caused by a fungal pathogen originating from outside of Europe and first observed in Poland in the 1990's (Needham et al., 2016). In 2006, the pathogen was characterised as *Chalara fraxinea* (Kowalski, 2006). Further analysis designated this the anamorphic stage of a non-pathogenic fungus endemic in the UK: *Hymenoscyphus albidus*. As *H. albidus* was endemic, remedial action was deemed unwarranted. However, in 2010, the pathogenic teleomorph was identified: *H. fraxineus* (Queloz et al., 2011). Dieback as a public concern issue is interesting because no particular manifestation of scientific uncertainty and no

radical shift in science or obvious 'event' formed the focus for public disquiet; often characteristic of such issues. What *had* changed is that by 2012 the media had become sensitised to the domain of plant and tree health more generally, because of the interaction of historical issues such as the failed forest sell-off and other 'invasive' species such as oak processionary moth (*Thaumetopoea processionea*) (Fellenor et al., in press-a). Dieback was initially discovered in the UK in a Buckinghamshire nursery in February 2012, arriving from the Netherlands on a consignment of ash saplings (Potter and Urquhart, 2016). In April 2012, the Forestry Commission (FC) published a pest alert for dieback. In September 2012 a pest risk analysis was circulated for consultation, and media attention heightened; peaking in mid-October. Media framing of dieback was negative, for example suggesting catastrophic outcomes for the future of UK ash trees and blaming the government for mismanagement of the affair. In early November, the government co-ordinated a rapid nationwide survey to establish the extent of dieback, followed by a tree-expert summit. Dieback became well established in the British countryside with widespread mortality of ash trees anticipated in many parts of the UK.

Background to the data

The FC has provided information on the threats to the health of trees as web and published resources for many years, together with an advisory service operated by Forest Research (FR), to provide advice and contribute to early warning and surveillance. Enquiries from the public are received by post, phone and email helplines. On October 2 2012, the FC produced a webpage dedicated to ash dieback that utilised existing helpline phone numbers and email addresses by which the public could report suspected cases. At the beginning of November, the Department for Environment, Food and Rural Affairs (Defra), the parent department of the FC, took responsibility for all media interest in dieback. On November 7 2012, the FC phone and email contact points were replaced with one dedicated helpline and email address managed by Defra. All phone calls and email contacts relating to dieback from the public were passed from Defra to FR for subsequent processing, along with enquiries received via the established routes. Public contact about dieback was useful in assessing the extent of its spread, i.e. providing confirmed sightings and cases to be followed up by inspection. Naturally occurring data such as emails and phone calls are invaluable because they avoid encouraging people to provide normative social descriptions (Given, 2008) and enable a consideration of changes in the

nature, variety and volume of public attention. They tell us something about public sensibilities and knowledge of dieback in the context of an official helpline set up by policy officials.

Publics influence and are implicated in processes of socio-scientific change in the sense that they can resist or support the application of scientific initiatives (Walker et al., 2010). This is relevant to dieback in the sense that policymakers and scientists ideally had to account for the 'public subjectivities' they would encounter during, for example, the deployment of remedial measures against dieback. Hence, how 'publics' and their concerns are conceived of, and the ways in which policy officials can access the knowledge such publics may hold, will shape assessments of the feasibility of remedial approaches (Barnett et al., 2012). Gauging public subjectivities around dieback is one way of assessing knowledge around the issue. This is useful for informing expert characterisations of publics and, consequently, the communication strategies they employ.

Aims of the study

The aim of the present study was to explore the nature of public attentiveness to ash dieback and how this related to public concern, by analysing a series of emails sent to the FC/Defra dieback helpline in November 2012. Specifically we addressed the following research questions. First, what was the profile of public attention to ash dieback over time? Second, how did people warrant contacting the helpline and what can we learn from this about who these people were? Finally, what was the nature of public attentiveness?

2. Method

Design and Procedure

Drawing on computational techniques for sorting and handling large volumes of digital data, a qualitative analysis of 1282 emails was carried out. The dataset consists of emails from people reporting suspected cases of dieback to the FC during the autumn of 2012 and date records for phone calls made to FC/Defra dieback helplines. Phone call data was used alongside the email corpus to ascertain levels of daily public-to-FC/Defra contact preceding and during the period of peak media attention to dieback and to contextualise rise and fall in public contacts via email.

Email content was explored using Textometrica (Lindgren and Palm, 2011), an online freeware tool for visualising and exploring co-occurrences of words in discrete blocks of text through connected concept analysis (CCA); a text analysis framework which brings the

interpretive stance of qualitative approaches to large corpuses of text, the size of which precludes comprehensive close reading. Using min-max normalization[1] techniques, Textometrica produces centre-weighted network maps enabling the researcher to 'sensitise' themselves to content and providing a means of developing and organising topics of interest according to qualitative conceptual coding of the text (Figure 1). Unlike content-analytic techniques that assess for word co-occurrence frequency, Textometrica's co-occurrence analysis is based on qualitative concepts that the researcher develops as they move between qualitative reading of textual units, e.g. discrete emails, and the initial output word lists produced by Textometrica. Each co-occurring word represents qualitative concepts that the researcher has arrived at via their interpretive coding of textual elements. Textometrica does not seek to produce a statistically robust and quantified analysis. Co-occurrence-value magnitude points the researcher toward interesting relationships in the text. This enables an interpretivist stance that prioritises peoples' experiences, while situating the researcher as actively involved in constructing social reality. This is in keeping with an abductive mode of enquiry (Locke, 2010) where analytic inferences are considered as 'plausible' rather than 'absolute'. Textometrica also facilitates a deductive mode of enquiry in that it enables the user to test ideas by making selections with regard searching for à priori terms.

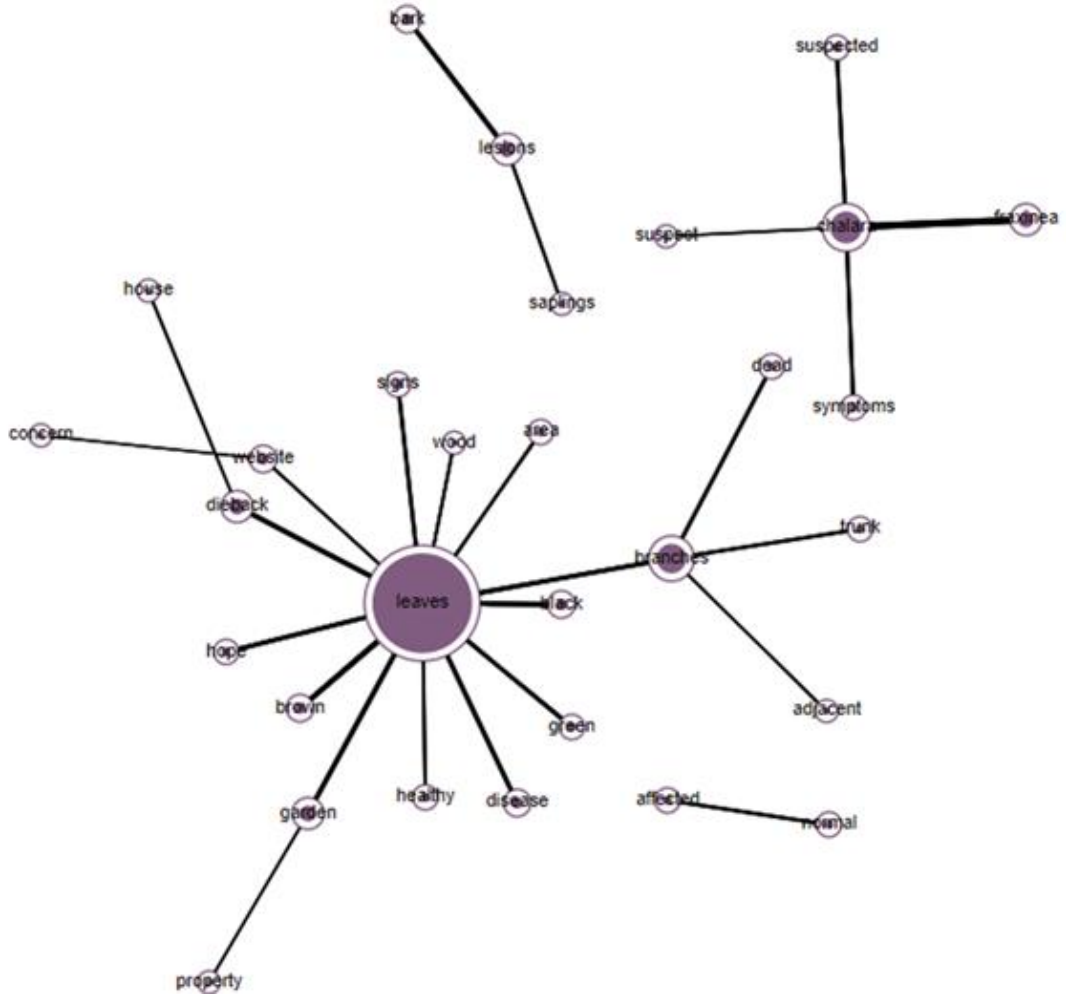

Figure 1. Exemplar Textometrica map. Node size represents relative frequency of term. Each node opens up into connected concepts. 'Leaves' is the most common term on this exemplar, strongly co-occurring with 'branches'.

Data procurement and ethical considerations

Access to FC phone call and email data for the autumn of 2012 and ethical compliance was negotiated with FR's Tree Health Diagnostic and Advisory Service. This ensured that the extraction and handling process satisfied FC, Defra and research data-protection guidelines. These data were accessed and edited by a member of the research team, under FR supervision during June and July 2016, until the dataset was fully anonymised and suitable for analysis. Editing involved removing any personal identifiers which might lead to the 'person sending the email' (PSTE) or other individuals or organisations being identified. PSTE anonymity is further assured in this paper by paraphrasing email content because the PSTE was not aware that their individual reports might be the focus of academic research.

Data comprised a spread sheet of the number of phone calls per day by date, and a spreadsheet of the date and edited content of every email sent to FC/Defra for the study period. Access to the data was restricted to research team members involved in the analysis. Ethical approval was granted by the University of Bath Psychology Ethics Committee.

Use of Textometrica

Textometrica was used in two ways. Firstly, it facilitated an abductive approach. As emails were read, associations between terms and concepts were noted and used to direct attention to salient topics within the emails, according to the volume of content reflecting specific co-occurring terms. Emergent analytic insights were framed as questions to follow up (Brooker et al., 2016). Having removed analytically uninteresting words such as 'the', manual scrutiny facilitated removal of very high (e.g. ash) and low (e.g. acid) frequency words so that they no longer appeared as map nodes. Textometrica enabled the frequency range to be adjusted so that word frequencies lower or higher than default could be explored. Adjusting these parameters is subjective; identifying terms of interest reflects the perspectives of the research team on relevant concepts. Each word was explored in relation to its semantic context within relevant emails, e.g. the terms and topics around the word selected, enabling synonyms to be grouped together under an overarching conceptual label. The initial list comprised 4614 unique words, with a corpus frequency range of 15 – 500. A list of 79 generic question prefixes was developed so that Textometrica could filter emails in terms of the questions that PSTEs had posed (Appendix A)[2].

Textometrica was then used deductively. Given the analytical focus on public concern and that dieback was framed in the media in a largely negative manner, e.g. government blame and so forth, it was envisaged that emails might reflect framing elements by utilising negative affective language. Hence, the data were filtered for instances of negative affective terms appearing in the Affective Norms for English Words list (Bradley and Lang, 1999), developed to provide a set of normative emotional ratings for a large number of English language words. There were 751 negative affective terms.

3. Results and discussion

What was the profile of public attention to ash dieback over time?

There was evidence of increased public attention to dieback in relation to pre-dieback levels of contact with Defra/FC. The data comprised 2263 phone call records dating from October 29 to December 31, 2012, including 126 records with no date. As no calls were recorded on November 7 and 11 and the Defra phone line was not manned at weekends after November 25, the 2136 records *with* a date are illustrated as a moving average in order to illustrate the general trend in calls (Figure 2). One thousand three hundred and sixty emails were recorded. Of these, 31 had no date, 3 fell in early 2012 and 44 were from 2013. Hence, 1282 emails from October 7 to December 31, 2012 were analysed (Figure 2).

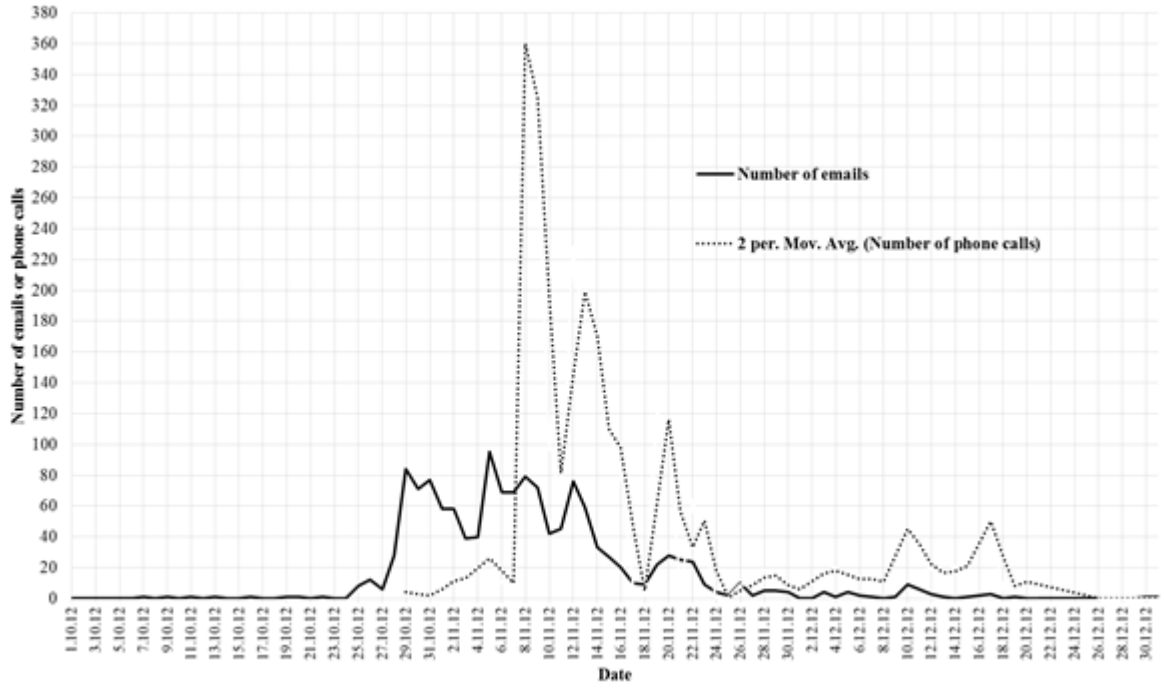

Figure 2. Number of emails and phone calls to the FC and Defra regarding dieback.

Preceding the peak of media attention, the number of phone calls and emails averaged less than one per day, increasing dramatically from October 25 and November 1 respectively to a peak of 440 combined mails and calls on November 8 (Figure 2). During this period, the number of newspaper articles attending to dieback also increased dramatically (Figure 3). Media interest in dieback had largely declined to pre-attention levels by the end of November 2012 and, apart from sporadic low-level spikes, this was the case for both phone calls and emails. It is noteworthy that Figures 2 and 3 indicate that the ratio of emails to phone calls is approximately 1:1.55. Despite the ostensible benefits of contact by email (Pieterson and Van Dijk, 2007), the

telephone clearly continues to be an important communication channel (Reddick, 2005) in this context.

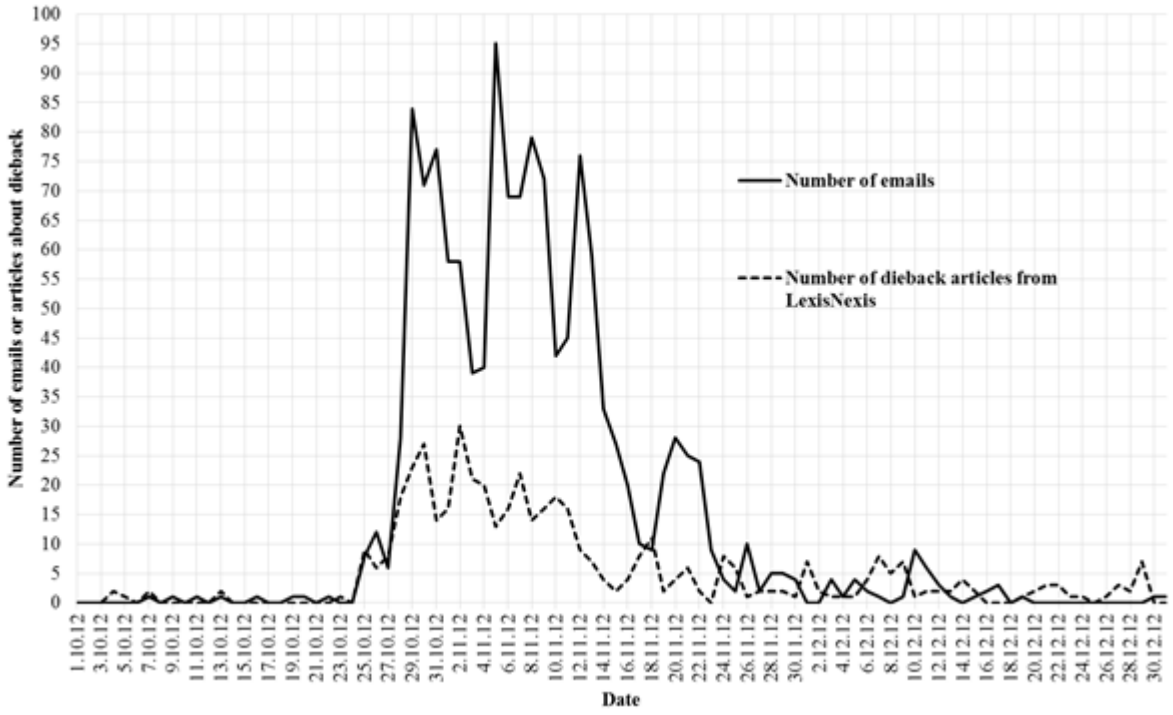

Figure 3. Comparison of number of emails to the FC with UK newspaper articles about dieback.

Email content included information about where potential dieback cases had been seen, and which tree-parts displayed symptoms. Average email length was four lines, with less than 100 words. There was no evidence of creative language use, e.g. 'emailisms' such as emoticons; i.e. shortcut means of expressing emotion (Petrie, 1999). Three hundred and twenty two (25.1%)[3] of all emails began with 'Dear Sir' or 'To Whom'. Overall, emails in the corpus followed a business-impersonal style commensurate with the formal and impersonal nature of the contact.

As noted above, in terms of calls/email volume, a heightened level of attention to dieback did not persist. Admittedly, calls and mails are 'discrete' events and do not necessarily provide any information about any temporal variation in individual affect, nor whether the PSTE continued to pay ongoing attention; avenues for further exploration. Nonetheless, at the very least, they provide a time-point metric of attention.

How did people warrant contacting the helpline and what can we learn from this about who these people were?

With regard our second research question, the analysis revealed explicit and implicit strategies that were used to justify email contact. The term 'media' appeared 27 times in the email corpus in 17 (1.3%) emails explicitly implicating media in the reason for contact, e.g. 'Given recent media coverage of Chalara, I have checked my coppice …'. In terms of media types, television was referenced twenty times and radio and newspapers once apiece. In these cases it is reasonable to suggest that reporting a suspected case of dieback was influenced by media coverage. A further motivating factor concerned the occupation or role of the PSTE, indicated in 89 (6.9%) emails. Seventy three different occupations/associations were apparent, of which 48 (3.7%) were woodland/tree orientated (Appendix B). The reason for contact sometimes reflected the individual's role. For example, 'I manage woodland in […] I am a Tree Officer for […] and had many telephone calls from the public'. One hundred and thirty seven (10.7%) emails referenced a previous contact with the FC helpline where photos had been requested. Woodland-focused non-governmental organisation membership was referenced in 13 (1.0%) mails, e.g. 'I belong to the Woodland Trust. They asked us to report […]'.

In sum there was limited evidence as to the nature of the publics responding to dieback. Making contact represents a reasonable response to the dieback issue insofar as it is implicated in peoples' everyday roles and responsibilities. PSTEs are similar in that they have responded to the dieback crisis by composing an email about dieback. In this sense they can be deemed an 'issue public' (Converse, 2006). Overall, it is useful to distinguish between a concerned public where the nature of their organisational affiliations or value-commitments predisposes or legitimises expressions of concern – or even encourages them - and those with no ostensible allegiances.

Given the ubiquity of social media and the emergence of e-democracy affording a [hybrid] space where lay, expert and policymaker voices co-exist (Callon et al., 2009; Fellenor et al., 2017), the boundary between expert and lay person is increasingly blurred. The emergence of social media also problematises the gatekeeping role of traditional media in that the former undermines gatekeeping and quality control (McNair, 2017). Given that some emails reflect organisational affiliations, the predisposition to contact can also be thought of as transcending the expert/public divide. Thus, while lay publics may have traditionally been 'excluded' from deliberation of scientific and technological issues (Callon et al., 2009), and

told ‘what to think’ by the media, our analysis sheds light on one way in which these arrangements appear to be changing, and how media, experts and publics are increasingly intermixed.

What was the nature of public attentiveness?

In relation to our third research question, an initial insight was that whereas some emails posed explicit questions, others did not. Four hundred and sixteen (32.4%) emails contained 543 explicit questions. Questions were coded into 39 discrete types (Appendix C). These types were then organised by similarity into five overarching conceptual categories (Table 1).

Category number	Category	Number of questions	Total
1	Is this dieback?	217	345
2	Action and management	77	
3	The nature of dieback	51	
4	Process related	158	198
5	Rhetorical question	40	

Table 1. Categories of explicit questions asked about dieback.

Category one pertains to whether the case in question was dieback or a different tree health problem, such as frost damage. Questions of this type were usually posed with a photograph of the tree, branch or leaf. The second category of questions focused on enquiries about what action should be taken and how dieback should be managed, e.g. how to dispose of affected plant material in a safe way or, more generally, what to do if dieback is suspected. Questions in category three were about the nature of dieback in general, including ‘what other trees can it affect?’ Only two emails asked who would pay for felling diseased trees. This is surprising considering the strong and negative media framing of dieback in terms of government blame and the burden of cost (Fellenor et al., in press-a).

Categories one to three represent ‘information requests’. In contrast, categories four and five represent ‘functional’ questions forming part of the interactional protocol of communication, or facilitating the exchange of information. Category four contained process related questions such as asking whether FC could visit the site or whether they should send in a tree-part sample. The bulk of questions in the final category reflected discursive and rhetorical

aspects of interaction. For example, ‘I have attached a photo. Is that okay?’ and ‘Perhaps this area is too special not to check out?’ Hence, 64% of questions were directly about dieback, and 36% involved accomplishing the social-interactional aspects of email correspondence. Given that asking about dieback was conflated with functional questions facilitating the interaction, asking questions per se does not necessarily suggest affective concern. Additionally, an issue for establishing how concern might be constituted is that asking whether a tree with black leaves is indeed dieback is not the same type of attention as expressing worries about falling trees - which may in fact connote more about ‘something’ falling and not dieback per se. What type of concern can be inferred from a PSTE asking if black ash leaves suggests dieback remains moot. Attention in this sense is in different registers but it is unclear how these relate to registers of concern.

Whilst 416 (32.4%) emails contained questions, 866 (67.6%) did not. Rather, they provided information. Emails containing questions were removed from the data set to ascertain the nature of email content beyond questions resulting in a subsidiary dataset of 866 emails, with 103 selected terms and a frequency range of 22 to 191. Semantically similar terms were grouped under a concept label, e.g. ‘black’, ‘yellow’ and ‘brown’, pertaining to abnormal leaf colour, conceptualised as ‘abnormal leaf colour’. Figure 4 illustrates the mapped 28 strongest co-occurrences. Three separate topic clusters, designated (1) - (3), are evident.

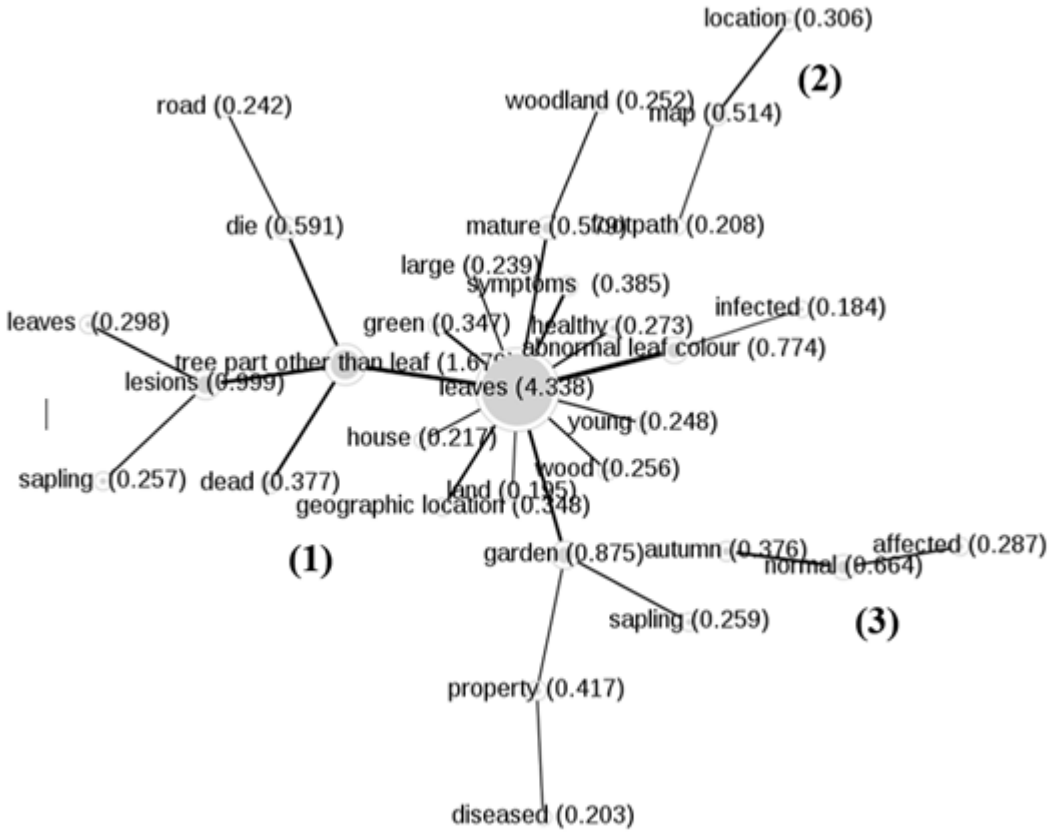

Figure 4. Co-occurrence map showing strongest co-occurrences for emails without explicit questions.

All clusters relate to the description of potential dieback symptoms. The strongest co-occurrences within the first cluster related to 'leaves' in association with 'abnormal leaf colour', with these terms appearing in 191 (14.9%) emails, e.g. 'The leaves wilted and turned black while on the tree'. After dieback-affected leaves, the next strongest co-occurrence reflected symptoms on other tree parts, such as '…big lesions over the trunk'. Forty eight (3.7%) of emails reflected a potential dieback case in a neighbouring property, e.g. 'In response to the news about chalara: I think my neighbour has it in her hedge'. Prompted by this observation, emails were assessed to determine instances of people reporting dieback beyond their property. Seven hundred and forty nine (58.4%) emails fell into this category, including locations such as roadsides, railway and canal embankments, parks, and footpaths.

The second cluster represented 24 (1.9%) emails where the PSTE made reference to a map so that they could illustrate where a potential case had been spotted, e.g. '…all along the footpath .[…] here is another link to the map'. The removal of place names in the data anonymization process reduced information about specific location. Cluster 3 comprised 21 (1.6%) emails representing the ambiguity of symptoms in terms of whether dieback or normal

autumnal leaf change was the issue, e.g. 'It could be just normal autumn leaf drop', or contrasting with unaffected ash trees '…with blackened leaves unlike their normal autumn look'. Figure 4 indicates the general template of information contained in emails, i.e. the symptoms leading the PSTE to suspect dieback, age of the tree and geographic location.

Given the relatively negative media framing of dieback (Fellenor et al in press)[4], we used Textometrica to explore the relationship between attentiveness, negative affect terminology, and 'concern' by filtering for terms reflecting negative affect. Out of 4664 unique terms in the corpus, 103 negative affective terms were present. Each term was assessed in its semantic context within each separate email. Terms that appeared as functional descriptors or as dieback effects were deselected, e.g. the term 'afraid' pertaining to 'I'm afraid the pictures aren't clear' and 31 (2.4%) instances of 'To Whom it May Concern'. Terms that were used in an affective context were retained, e.g. 'anxious' as in 'they were anxious for me to report this…'. Thirty-one terms with a cumulative frequency of 284 instances were retained (Appendix D). Textometrica selected the 32 strongest normalised co-occurrences (Figure 5). Overall, 338 (26.4%) emails contained terms suggestive of the PSTE adopting a negative affective orientation to an aspect of dieback.

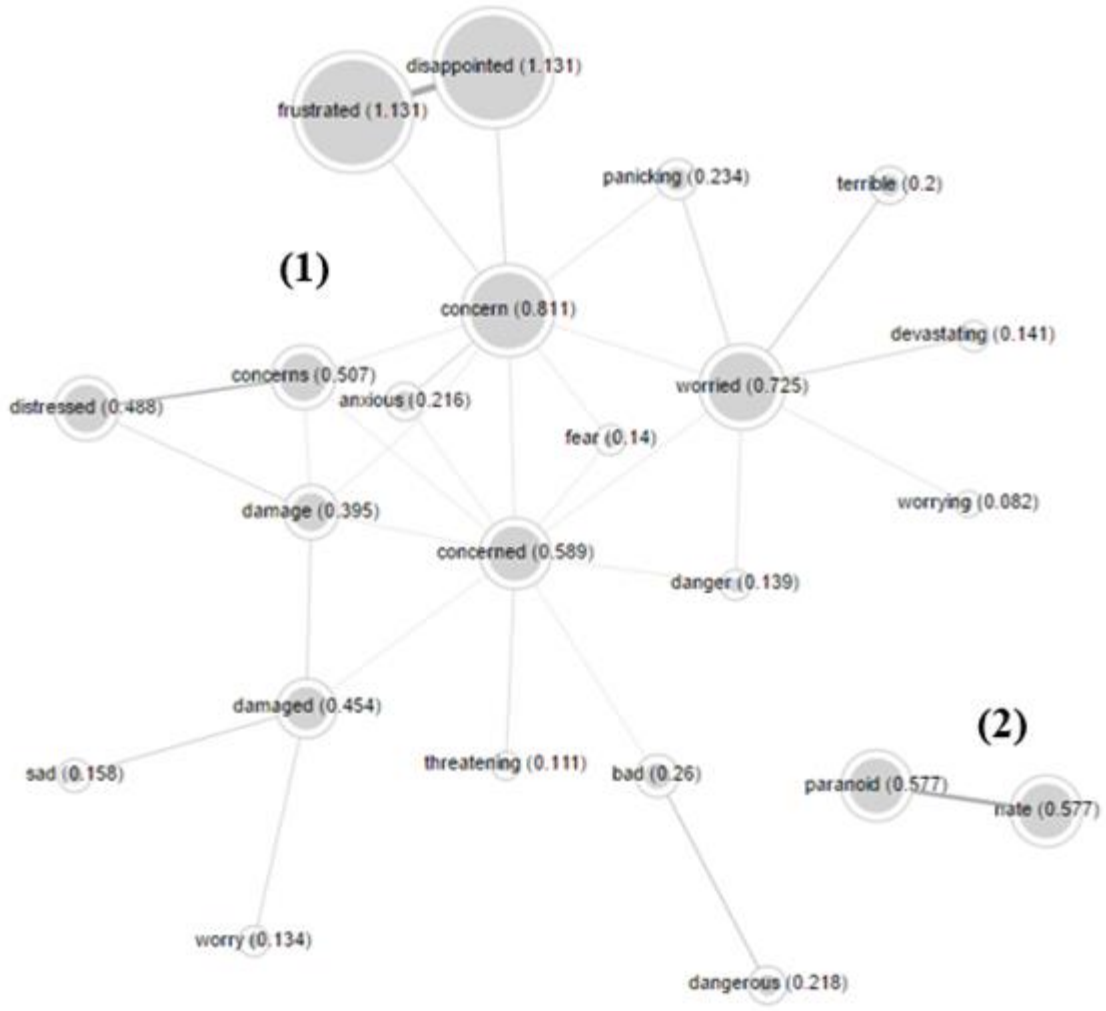

Figure 5. Textometrica map illustrating selected negative affect terms.

In cluster 1, the strongest co-occurrences are between 'frustrated' and 'disappointed'. These terms each appear only once in the corpus, in '… I was frustrated and disappointed by the lack of co-ordination between organisations and the uninterested response to my frank concern…'. Given that these terms appear together in one email, a strong co-occurrence value is unsurprising. Nonetheless, the full content of this email suggests a PSTE who indeed represents a member of an affectively 'concerned public', responding to the representation in the media of the crisis-nature of dieback. The second strongest co-occurrence, cluster 2, was between 'paranoid' and 'hate', again appearing in only one email: '…my neighbours are paranoid that it's diseased. I just think they hate my tree!' In this case, the affective terms were not used to convey a personal affect in relation to dieback per se.

The term 'worried' appeared in 20 (1.6%) separate emails, e.g. 'I am worried it might be the disease in the media'; later described in the same email as 'devastating'. 20 emails

deployed ‘worry’ that a tree or trees may be diseased, one email used worry in relation to practices potentially spreading the fungus, and 2 emails reflected worry about trees falling over. The most prevalent negative affective term, 167 (13.0%) mails, was ‘concern’ and its extensions. These emails were scrutinised to determine the context. 14 different contexts were apparent, Table 2.

Category	Context in which ‘concern’ is deployed	Frequency of use
a	‘To Whom it may Concern’	31
b	Non-specific concern about dieback	27
c	Specific tree(s) have dieback	20
d	Specific symptom, e.g. leaf drop	20
e	References media concern	15
f	Spreading dieback	9
g	Physical damage, e.g. a tree uprooting	8
h	human safety aspect, e.g. tree falling	8
i	Enquiring whether they should be concerned	7
j	Reports that somebody other than the PSTE is concerned	7
k	‘Sorry if I am wasting your time, but I was concerned’	5
l	Wonders whether the email recipient is concerned	4
m	Because they are directly concerned, the PSTE is reporting it	3
n	Expressing dissatisfaction with regard lack of organisations’ concern	3

Table 2. Frequency of terms reflecting different contexts of use of the term ‘concern’.

Context (b) represents the most common reference to direct concern. However, the nature of concern was not explicit, e.g. ‘I have been very concerned about the fungal disease threatening ash trees in this country’. 20 (1.6%) context (c) emails reflected concerns about specific trees, e.g. ‘I am concerned a mature ash on my property has chalara’. As with the previous category, the deeper nature of the specific concern is not apparent. However, while the former relates to a concrete instance of concern, the latter is abstract in that concern is decontextualised. The 16 (1.2%) emails in categories (g) and (h) pertain to damage to property and the potential for harm to people, e.g. ‘I have concerns that dead trees may fall and damage my house’ and ‘I am

concerned my tree will fall on my grand-daughter when she is playing'. There were two further references to children, one connoting harm from falling trees and the other enquiring whether the fungus was harmful to children. In line with the points made above, (e) reflects the PSTE referencing media concern as a frame for their contact, e.g. '…in view of concerns about ash in the media, I inspected the tree and noticed […]'.

A further interesting finding is that PSTEs often reported a tree not on their property and this may reflect a general awareness or attention to the environment or at least the place of ash in it. When people report a tree on a neighbour's property it may appear that an individual is reporting dieback because of an altruistic concern for the neighbour or the environment, but the motivation may surreptitiously involve their self-interest (Schultz, 2001), for example, anticipating damage to their property or removal costs of infected material.

Nonetheless, if twenty five percent of emails included negative-affective terms, 75% of people did not include such terms and thus provided no reflection of negative media frames and their terminology; blame, catastrophe and so forth (Fellenor et al., 2017). This is commensurate with the vast body of literature indicating no [simple] linear transfer of affect, and adoption of discourses of concern, from media to public (Barnhurst, 2011). Although the spike in phone and email contacts might at first sight be thought indicative of public concern, the nature of the responses appear measured and proportionate and largely devoid of negative affect or content of the media frames being deployed over that period, although we cannot conclude that the PSTE is *not* experiencing concern.

As noted previously, there is a problem of differentiating between the affective and cognitive responses to a risk or hazard. This is compounded by the semantic issues involved in differentiating between deployment of terms such as 'worry' indicating affect, as opposed to 'concern' as mere involvement. Berenbaum et al. (2007), in their study of the relation between worry and concern, operationalise the latter as domains [e.g. health, achievement] about which people may or may not worry, i.e. worry as anxiety. They suggest that specific domains of concern were weakly associated with worry. However, greater worry was associated with higher probability and cost estimates. Extrapolating to ash dieback, it is possible that the more concrete the threat, i.e. the expense of having one's diseased ash tree removed, is associated with worry as felt anxiety in a way that abstract knowledge of the issue does not. Making the distinction between concern and its synonyms based on everyday language use remains problematic. Assessing whether PSTEs experienced concern as, for example, a visceral

response, would necessitate a methodology which enabled us to assess the relationship between the semantics around the use of concern terminology and what people 'felt'. This was not possible, given the data at our disposal.

Nonetheless, the analysis of the data does not support any accusations of irrational concern that *could* be levelled at the public by risk experts (Petts et al., 2001). Instead, the present study has provided evidence that attention to dieback, through emails sent to Defra/FC, was articulated in a rational and reasonable manner and with reasonable cause for the contact. Attention to an issue does not necessarily equate to concern in an affective sense, or indeed worry. Beyond the shared characteristic of providing information about potential dieback cases there is little evidence to suggest any deeper political engagement**,** or concern in its affective sense. This echoes the suggestion that concern with an issue does not necessarily follow from offering or seeking information or opinions about it (Kim, 2009).

5. Conclusion

Understanding the nature of public attentiveness allows more effective policy and operational responses to risk-related issues. In terms of the assumption that public concern equates with public attention, or volume of contacts from the public, the present study has revealed that whilst these equivalences appear to hold at the collective level, they largely disappear at the individual level. At the micro level of the individual a range of different reasons for contacting the helpline are apparent. Individual attention to a 'public' concern issue reflects individual contexts and motivations and hence has a 'private' orientation (Couldry et al., 2016). Moreover, the boundary between public and private is somewhat blurred in that whilst some issues of concern may be envisaged as requiring a public, or collective, resolution, others do not. Hence, dieback is better thought of as an issue of *collective attention*, rather than concern. Furthermore, the results of this study challenge any simplistic notion of the relationship between the nature of media attention and public attention. There were few allusions to the media and, perhaps more importantly, little evidence of media framings of dieback in the emails. Examination of what public concern looks like when explored at the individual level reveals heterogeneous processes with multiple dimensions easily lost to sight. At the macro level and in relation to 'business as normal', Defra/FC witnessed a spike in contacts that can be read, at the very least, as significant levels of public attention. Nonetheless, those that are emailing represent a small yet visible public beyond which may exists publics' that are active in other ways; as well as

perhaps a a larger hidden or inactive public. The possible existence of such imagined publics below the water line also exert an influence on the policy process (Barnett et al., 2012).

What is the value of email content and public knowledge about dieback to policymakers?

The general content of emails is proportionate and relevant to the FC invitation to provide information about symptoms and tree location. It reflects people trying to be helpful, as much as it does concern. However, independently of content, each email represents a 'unit of evidence' that policymakers can take as a marker of public concern in and of itself, thus reading the increased volume of emails as increased concern. The value of emails to policymakers is twofold: firstly, in terms of the practical information it provides about dieback and, secondly, as a quantifiable measure which policymakers can call upon as 'evidence' to justify policy. However, a problem with using emails as a marker of concern is that the FC, Defra and other policymakers already knew about dieback and its potential, as demonstrated by setting up a dedicated helpline that the public could use to report it. It was in their interest to enrol the public to find out where dieback was and where it might be spreading. This means that public concern around dieback always-already incorporated an element of 'policy concern'. Since the public were 'invited' to contact FC/Defra by the setting up of a dedicated phone line, policymakers, the media and organisations were attuned to expressions of public sensibilities; arguably creating a public- concern shaped 'space' that contacts from the public unsurprisingly filled; their 'concern' subsequently becoming central to dieback narratives (Tomlinson, 2016). Hence, public concern is more usefully framed in a way that does not make it appear that concern originates solely in a public, *or* as detached from existing policy concerns. Extrapolating from Wardman and Löfstedt (2018) for example, such a framing would usefully inform and temper any pre-emptive precautionary measures on the part of policymakers, aimed at allaying undue media attention with regard a given concern issue.

The relationship between expert, public and policy is dynamic and evolving. 'Public concerns' and their representation similarly evolve. Novikau (2017), for example, illustrates how the nature of public concern in Belarus with regard the risks and benefits of nuclear power transformed across time. The initial content of concern reflected health issues post the Chernobyl nuclear accident in 1985, with the government ascribing concerned publics as irrational or 'radiophobic' in an attempt to down play the issues. However, as policymakers later sought to implement a nuclear power programme the key features of concern transformed, taking shape along economic lines as the anti-nuclear lobby realised that a counter narrative to

'radiophobia' could not be constructed whereas a narrative of resistance built around rational economic and security issues could. Hence we concur with Gill et al. (2017) that policy and public concern narratives are inevitably entangled, always processual, and distributed across heterogeneous actors and spaces. For example, 'surface' concerns with protecting the environment may be predicated on deeper, longstanding sociocultural beliefs and tropes which mediate the 'form' that policy can/will take, and also how people orientate toward an issue (Argent, 2013).

Although increasingly challenged, the traditionally held view of the public understanding of scientific and technical issues is one of passivity, ignorance and worry (Cotton and Devine-Wright, 2012). This is often in relation to what 'experts' assess as 'correct' technical information communicated accordingly. As we have demonstrated, questions from PSTEs were reasonable and aimed at resolving a pragmatic interest. Moreover, they implicitly and explicitly provided information for the FC. This information becomes part of the broader field of scientific and technical knowledge around dieback, for instance as a geographical mapping of potential spread. Hence, knowledge about the hard science of dieback is augmented by what this means to people. As such, one way of challenging a perceived divide between scientific knowledge and a knowledge deficit is as *hybrid knowledge* (Thomas and Twyman, 2004), i.e. the intermixing of [scientific] systematised, explicit, transferable knowledge with knowledge that is [local] tacit, contextualised and informal (Reed, 2008). The knowledge provided by PSTE's about dieback affords a firmer foundation for developing relevant environmental policy and practice and goes some way toward a mode of knowledge that challenges scientific knowledge as the 'de facto author of public meanings, thus also of proper public concerns' (Wynne, 2014: 62).

Notes

[1] See for example Al Shalabi et al. (2006).

[2] Appendices including the occupation of respondents and question prefixes have been made available as a supplementary file, available at http://pus.sagepub.com

[3] Throughout, percentages within brackets are in relation to the total number of 1282 emails analysed.

[4] Nexis was used to retrieve headlines from all ash dieback articles in UK newspapers in 2012. One hundred headlines were randomly selected out of 270. Using 'risk signals' such as 'killer', 'death' and 'threat, alongside overall tone, headlines were coded as negative, neutral or positive with regard to how dieback was framed. E.g. 'No ash dieback yet at resort woods' was coded as neutral, whereas 'dieback not as bad as thought' was coded

as positive. 52% of headlines were mutually coded as negative. Coding reliability was tested by two raters; Cohen's kappa (k) = 0.73 (95% CI, 0.61 to 0.85), i.e. good to very good agreement (Landis and Koch, 1977).

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Supplementary appendix A:

Generic question prefixes

Any advice	How likely	What might
Anything we can	How should	What should
Are these	How will	What would
Are you able	I would	When can
Can anything	If you could	When is
Can I	Is anybody	Where is
Can it	Is anyone	Where might
Can this	Is it	Where should
Can we	Is it possible	Where will
Can you	Is there	Which is
Could anybody	Is this	Who could
Could anyone	Please advise	Who did
Could it	Please can	Who do
Could somebody	Please do	Who is
Could someone	Please don't	Who might
Could the	Please let	Who will
Could this	Please will	Whose
Could we	Please would	Will I
Could you	Should I	Will it
Do we	Should we	Will we
Do you	Should you	Would it
Does anything	We would like	Would somebody
Does it	What can	Would someone
Does my	What do	Would we
How can	What do you	Would you
How important	What if	
How is	What is	

Supplementary appendix B:

List of woodland or tree orientated occupations

***** Living*****	Head Groundsman
Apple *****	Head of Landscape
Arboricultural Officer	Head Warden
Arboricultural Surveyor	Honourable Secretary, Community Woodland
Arboriculturist	Land Management
Assistant Arboricultural Officer	Landscape architect
Assistant Planner Tree Preservation	Landscape Manager
Biodiversity Data Officer	Park Ranger
Biodiversity Outreach Officer	Plant Diagnostician
Biodiversity Technical Officer	Plant Pathologist
Centre for Environmental Education	Ranger
Community Tree Officer	Reserves Manager
Community Wood Officer	Senior Ranger
Consultant Ecologist	Trainee Arboriculturist
Consultant landscape architect	Tree Officer
Corporate Support Officer	Tree Services
Countryside Officer	Tree Surgeon
Countryside Ranger	Tree Surveyor
Environment Warden	Tree Warden
Environmental Co-ordinator	Trees Project Officer
Estate Administrator	Woodland Conservation Officer
Forest Park Warden	Woodland Officer
Gardening and *****	Woodland Rights of Way and Access Officer
Head Forester	Woodland Wildlife

Items including asterisks are organisations which have been anonymised.

Supplementary appendix C:

Categories of questions asked

Category (total number of questions in category)	Description	Tally
Is this dieback? (217)	Is it dieback?	107
	Someone else thinks its dieback	4
	Should I be worried?	13
	Does the photo confirm its dieback?	41
	Is this symptom chalara?	36
	Are you concerned this is dieback?	5
	Could the damage be other than dieback?	10
	Is it chalara or a different disease?	1
The nature of dieback (51)	Is it an ashtree?	15
	Question about behaviour of dieback (will it spread?)	10
	Is it dangerous physically?	10
	Is there a test for dieback?	7
	Will the disease spread/to other species?	6
	What are the risks from dieback?	2
	Suggestion about what is spreading it	1
Action and management (77)	What is the protocol for managing infected plant material?	23
	Can I treat it in this way?	7
	What action should I take?	37
	Can I minimise the risks?	2
	Can I get my tree protected?	1
	What will happen if it is dieback?	5
	Who pays for the problem?	2
Process related (158)	Can you advise me?	54
	Will you come and visit me?	21
	Can you look at these photos?	6
	Who is responsible for this land/tree?	3
	Can you confirm you got my photos/mail?	3
	Can I send you some photos?	4
	Can I send you a sample?	2

	Who should I report this to?	10
	Who can advise me?	7
	Do you want to visit me?	11
	Should I send you a sample?	6
	Should I send more photos?	6
	Do you require more information from me?	24
	Can I have more information about dieback?	1
Rhetorical question (40)	Discursive/rhetorical statement	27
	Functional question i.e. can you get this size of mail?	7
	Response from FC	6
Total number of explicit questions		**543**

Supplementary appendix D:

Negative affective terms used in an affective context

annoyed
anxious
bad
blame
concern
concerned
concerns
damage
damaged
danger
dangerous
devastating
disappointed
distressed
disturbed
dreadful
fear
frustrated
hate
panicking
paranoid

sad
sadness
terrible
threat
threatening
tragedy
tragic
worried
worry
worrying