

1 **Prioritising stakeholder engagement for forest health, across spatial, temporal and**  
2 **governance scales, in an era of austerity**

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16

17 Abstract

18 Tree health is a major concern for forest managers as well as others who enjoy the benefits

19 of trees, woods and forests. We know that stakeholder engagement can help define what

20 people find important about forests and woodlands, assist in the development of better

21 management approaches, enhance buy-in of strategies proposed and create a stronger

22 democratic dialogue. However, tree health offers particular challenges for stakeholder

23 engagement because of the wide range of stakeholders potentially involved and budget

24 tightening under economic austerity. Stakeholders are present at different spatial scales

25 (local, place specific; regional; national and international) and need to be engaged cyclically

26 and over different temporal scales, sometimes in immediate decision making but also in

27 planning over longer timescales, for which decisions have implications for woodlands in the  
28 long term future. Hence, we need to know not only with whom we *could* engage, but also  
29 with whom we *must* engage. Our research questions are: with whom, why and how should  
30 we engage across spatial, temporal and governance scales and with limited resources to  
31 achieve philosophical and practical goals regarding tree health? How do we prioritise  
32 engagement efforts to obtain 'best value'? We undertook two tree health projects, both using  
33 and investigating the concept of 'stakeholder engagement' in the UK: 1) exploring the concept  
34 of resilience with tree health stakeholders; 2) exploring how stakeholder engagement could  
35 enhance technology development for the early detection of tree pests and pathogens. We  
36 carried out interviews and experiential interactive activities and ran workshops and  
37 collaborative field trips with a range of stakeholders. We found that mapping stakeholders  
38 identified a complex network of hybrid individuals and roles overlaid on a projectscape that  
39 spanned multiple research and practice initiatives. It was clear that as well as undertaking  
40 discrete engagement activities, it was important to develop ongoing collaborative  
41 conversations, facilitated through networks and alliances. Stakeholder engagement was more  
42 effective when interactive, innovative or experiential means were employed. There was a  
43 tension between recognition of the value of communication and the time and resources  
44 required for engagement. Whilst the state is attempting to devolve responsibility, structural  
45 constraints, resource restrictions and knowledge gaps are limiting the capacity of others to  
46 fulfil these expectations. It was concluded that, despite economic austerity, investment is  
47 required to support relationships and networks, promoting normative and substantive forms  
48 of engagement and countering the audit culture, rather than focusing merely on  
49 instrumental, easily measurable, short term gains.

50 Keywords: forest health, biosecurity, stakeholder engagement, scale, cost, resilience

## 51 **Highlights**

52

- 53 • Stakeholder mapping reveals a complex layering of hybrid roles and spatial variation
- 54 • Stakeholder engagement occurs across a convoluted research and practice  
55 projectscape
- 56 • Interactive engagement, especially experiential, dialogic or fun, is preferred
- 57 • A lack of personnel, time, resource and knowledge limits stakeholder capacity
- 58 • Investment is required to support relationships and networks for effective  
59 engagement

60

61 **Introduction**

62 ***Tree health and biosecurity***

63 Tree health has been a global concern especially over the past decade, with increasing  
64 globalisation, international trade, climate change and changes in social practice increasing  
65 invasion and risk and spread of new pests and pathogens (Marzano *et al.*, 2017).  
66 Environmental management requires stakeholder engagement (Blackstock *et al.*, 2007; Reed  
67 *et al.*, 2009) and this is especially true for tree health, which requires integration of different  
68 kinds of knowledge and has both specific, short term impacts and long term consequences  
69 that affect a wide range of stakeholders whose livelihoods, recreation, places or cultures are  
70 affected. For example, whilst pest invasions may require action against a new pest or disease  
71 to be taken within hours or days (Dandy *et al.*, 2017), subsequent planting decisions can have  
72 consequences several decades later as trees mature. In this paper we draw on two tree health  
73 projects in the UK to develop insights into stakeholder engagement against a background of  
74 multi-level governance, with limited time and resources. With the presumption that  
75 resources allocated for engagement will be limited, we seek in this paper to identify how we  
76 might prioritise stakeholder engagement across spatial and temporal scales in an era of  
77 austerity and audit.

78 The UK has experienced significant recent pest and pathogen impacts on forests and has  
79 responded with increased research (funded by national research councils) and policy (at UK  
80 and devolved state levels) initiatives on which we can reflect for future UK and wider  
81 geographical contexts. Over the past few years, UK tree health policy has promoted  
82 engagement with mainstream stakeholders (DEFRA, 2014) but mapping of tree health  
83 stakeholders demonstrates a complex landscape of individuals and organisations (Marzano  
84 *et al.*, 2015; Dandy *et al.*, 2017; Marzano *et al.*, in press). Research to date has focused on  
85 who has a stake, how stakes can change over time and some impacts of engagement. There  
86 is less information suggesting what form of stakeholder engagement is most effective, and  
87 how agencies that are suffering significant constraints may allocate limited resources to  
88 maximise impact. A combination of fora for collective interaction and group specific tools can  
89 support engagement, but individuals express limited opportunity to interact with all  
90 engagement opportunities (Marzano *et al.*, in press). Whilst there have been some awareness  
91 raising campaigns, these have rarely been evaluated and there is little empirical evidence in

92 the tree health sector to support the belief that face to face contact is key to effective  
93 engagement (Marzano *et al.*, 2015).

#### 94 ***Prioritising stakeholder engagement***

95 The practical constraints of spatial, temporal and governance scales, fiscal austerity and audit  
96 demands within and across state, agency, organisational and project groups responsible for  
97 engagement mean that these groups (including researchers such as ourselves) will need to  
98 prioritise and defend engagement strategies that are pragmatic and achieve value for  
99 resources. We must make tough decisions about why, who, how to engage; what do we wish  
100 from our engagement; how much is enough? This paper explores these challenges using tree  
101 health as an area of enquiry.

102 Whilst there is research demonstrating which stakeholders have an interest and responsibility  
103 in tree health (Marzano *et al.*, 2015; Dandy *et al.*, 2017; Marzano *et al.*, in press), stakeholder  
104 engagement still holds challenges for those with a mandate to engage. In practice, there are  
105 resource constraints around management decision making and implementation. The era of  
106 austerity in UK has squeezed most public budgets further, demanding that government and  
107 public agency staff defend time and cost investment in participation activities. The research  
108 impact agenda in UK reflects a demand for socially accountable research, causing more  
109 researchers to establish stakeholder communication, or at least active dissemination of  
110 results and hence increasing the opportunity for engagement with non-academic  
111 stakeholders, but also generating some perverse outcomes and sometimes questionable  
112 modes of engagement (Martin 2011).

113 Hence we need to know not only with whom we *could* engage, but also with whom we *must*  
114 engage; we need to ask questions not only about why, whom and how we must engage but  
115 also explore engagement methods that offer value for money and explore the possibility for  
116 shared, integrated forms of stakeholder engagement. These questions are valid both for  
117 statutory agencies with an obligation to implement policy and for researchers seeking to  
118 widen inquiry regarding tree health theory and practice, as will be discussed later.

#### 119 ***Participation and stakeholder engagement: rationale and challenges***

120 It is widely accepted that participation of relevant stakeholders is desirable in environmental  
121 management (Beierle and Konisky, 2000; Stringer *et al.*, 2006; Reed, 2008), but in practice  
122 there are challenges in determining optimum forms of participation and in theory there are  
123 potential concerns about philosophy, intention and implementation. There has been a shift  
124 from top down approaches, dominated by a western scientific paradigm, towards more  
125 decentralised modes permitting diverse views of the environment and different management  
126 approaches (Beierle and Konisky, 2000; Kapoor, 2001). Participation in environmental  
127 decision making is seen to be a democratic right (for example: the 1998 Aarhus Convention  
128 on Access to Information, Public Participation in Decision-making and Access to Justice in  
129 Environmental Matters), placing an obligation on those developing decisions (policy makers),  
130 implementing policy (practitioners and agencies) and producing and exchanging academic  
131 knowledge that could inform decisions and management (researchers). Support for  
132 participation by these actors derives from the understanding that participation delivers a  
133 number of advantages, including instrumental (assisting with practical implementation and  
134 defusing conflict), substantive (highlighting multiple perspectives which leads to better  
135 understanding and selection of appropriate solutions) and normative (social and individual  
136 learning enriches participants and wider society) benefits (Blackstock *et al.*, 2007). However,  
137 there has been some disillusionment and critique of participation processes, including a focus  
138 on minority interests to the detriment of the wider public (eg (Cooke and Kothari, 2001) and  
139 the implementation and management of participation within environmental management  
140 can be complex, often requiring pragmatic trade offs (Porth *et al.*, 2015).

141 Participation is a concept used to incorporate different forms of engagement within  
142 environmental management. Early definitions outlined differences between tokenism  
143 (information, consultation), involvement and empowerment as the degree of participation  
144 intensified (Arnstein, 1969). Public participation is still understood to span different forms of  
145 participation from communication with stakeholders (including general communication with  
146 the wider public or specific sectors of the public) to meaningful input by stakeholders (often  
147 specific groups) (Rowe and Frewer, 2000). More recently, we have seen diverse forms of  
148 empowering participation promoted, such as collaboration (Davies and White, 2012), co-  
149 design (White and van Koten, 2016) and partnership (Leach *et al.*, 2002). Broadly, whilst more  
150 intense forms of participation may deliver greater empowerment and benefits (Reed, 2008),

151 they are also resource intensive in terms of time and resources (human, institutional and  
152 financial) (Kapoor, 2001), both by facilitators and participants. Participation goals may also  
153 differ depending on purposes of participation, and on ethical and normative choices as well  
154 as practical cost implications (Lynam *et al.*, 2007); whether a project is in design,  
155 implementation or dissemination of results phase; whether for research or management; the  
156 scale of the project, programme or policy; and the anticipated response (consensus or  
157 conflict).

158 Participation can incorporate broad public participation, including participant driven voices in  
159 environmental decision making (Rowe and Frewer, 2000). However, 'stakeholder  
160 participation' includes more specifically those who are affected by or can affect a decision;  
161 and environmental managers and researchers often focus more directly on these groups  
162 rather than on the wider public (Reed, 2008). The participants in such initiatives may include,  
163 but generally go beyond, 'community participation'. 'Stakeholder engagement' is the active  
164 solicitation of participation by those coordinating policy, practice, or research in a particular  
165 field. As with the notion of participation, it is not an unproblematic term. The definition of  
166 'stakeholder' is complex, the term being developed for business management and generally  
167 being understood as an individual or organisation with an interest in an issue; often as  
168 affecting or being affected by the issue (Prell *et al.*, 2009; Reed *et al.*, 2009; Dandy *et al.*,  
169 2017). However, there has long been debate over the extent to which a stakeholder can be  
170 defined only in terms of an instrumental role with an issue or as a moral being with individual  
171 views and the propensity to act in relation to an issue (eg (Freeman, 1994)). The latter view  
172 thus provokes consideration of whether and how an individual stakeholder acts on their own  
173 behalf or represents an organisation or initiative. Interactions among stakeholders or with  
174 stakeholders are further complicated by the effects of experience, trust, relationships and  
175 understanding (Davies and White, 2012). The term 'engagement' refers to the form of  
176 participation solicited, which may vary from information delivery to an empowering form of  
177 devolution of power as described under forms of participation above.

### 178 ***Scale and multi-level governance***

179 Deciding why, who and how to engage can be challenging. Successful stakeholder  
180 engagement requires some form of stakeholder analysis, and assessment of who should be  
181 engaged can be an ongoing participatory process within engagement activities (see (Reed *et*

182 *al.*, 2009)). Environmental issues often manifest at local, regional, national and international  
183 levels. Yet stakeholder analyses do not always specify how we can effectively engage at these  
184 multiple levels. Involving local stakeholders across wide spatial scales can cause problems  
185 with transferability and comparability, making scaling up difficult, and can increase resource  
186 requirements for participation (Stringer *et al.*, 2006) Stakeholder analyses tend to focus on  
187 interests, power and responsibilities without explicitly addressing scale, although recognition  
188 of a dynamic suite of stakeholders across time is expressed in more normative forms of  
189 stakeholder analysis (Reed *et al.*, 2009). Elected decision makers may act for short term  
190 outcomes within their jurisdiction, and see their regions as 'closed' systems unconnected to  
191 wider constituencies (Bai, 2007; Bai *et al.*, 2010). Spatial and temporal scale mismatches in  
192 public participation have been identified in a number of settings, including urban  
193 environmental governance, where policy often has to function at a city or regional scale yet  
194 link to global initiatives (Bai *et al.*, 2010), and water catchment zones, where participation  
195 must negotiate scalar challenges of local stakeholder engagement whilst also functioning  
196 effectively at regional and international levels (Jonsson, 2005).

197 Consideration of scale and stakeholder engagement in environmental management is closely  
198 linked to the concept of multi-level governance, which can be perceived as creating linkages  
199 across centre and periphery, state and society and the domestic and international (Piattoni,  
200 2009). A critical part of multi-level governance is the process that permits different actors to  
201 participate (Newig and Koontz, 2014). Multi-level governance can actually expose tensions  
202 and power effects between the *global* imperative for environmental management and  
203 growing views of environmental services and resources being seen as public goods; and the  
204 *local* ownership and consequences of environmental management (Adger *et al.*, 2005). Whilst  
205 multi-level governance encourages the support of non-state actors in decision making across  
206 various scales of governance (Piattoni, 2009), the concept of polycentric governance  
207 acknowledges bottom up as well as top down engagement in governance (Newig and Koontz,  
208 2014). This complex multi-level environmental governance is often acknowledged to require  
209 adaptive management skills and strategies to enable resilience in the face of environmental  
210 and social change (Berkes and Folke, 1998).

211 The contemporary neoliberal context has had adverse affects on the natural environment,  
212 heralding an era of the increased privatisation of resources, the marketisation of nature, and

213 a government step back from regulation. Alongside this, a prevalent market based set of  
214 environmental policies, incorporating an audit culture, has demanded measureable benefits  
215 from investment and resource allocation. Neoliberalisation is an uneven process. Tree  
216 resources have been a research focus for those studying green neoliberalism (McCarthy 2005;  
217 2006, Castree, 2011, Munster & Munster 2012), eco-governmentality (Goldman 2001), green  
218 grabbing (Fairhead et al 2012; Devine 2016) and the green economy (Arsel & Buscher 2012;  
219 Turhan & Gundoganb 2017). Research in this area has focused mainly on new forms of  
220 colonialism in the Global South.

221 Processes of neoliberalisation, combined with the recent recession, have placed severe  
222 resource restrictions and pressures on environmental policy making, management, and  
223 research activities. Alongside the selling of nature as part of a neoliberal agenda, society has  
224 also been adversely impacted by the State offloading responsibility for care, protection and  
225 securitisation to its citizens. This has been well documented in the fields of border studies and  
226 human migration (eg D'Souza 2015), but less so in the field of plant and environmental health.  
227 Many governments have imposed austerity measures, with different spatial manifestations  
228 and, in turn, in some respects the financial crisis has strengthened neo-liberal focus (Pugali et  
229 al 2014). Hence we explore the nature of stakeholder engagement in natural resource  
230 management within this context. The aims of the paper are thus to contribute to theoretical  
231 understanding of 'stakeholder engagement' within this contemporary framing, particularly  
232 around prioritisation and cost; and to offer practical recommendations to those concerned  
233 about the health of our trees, woods and forests.

234

## 235 **Methods**

236 We draw here on two projects. The first, Early Detection Technologies, aimed to explore new  
237 technologies for the early detection of tree pests and pathogens<sup>1</sup>, working on the premise  
238 that stakeholder engagement would enhance socio-technological innovation. We mapped  
239 stakeholders using previous research (Marzano *et al.*, 2015; Dandy *et al.*, 2017), project team  
240 contacts, snowballing, and open and specialist invitations. We reached near saturation after

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<sup>1</sup> Project title: New approaches for the early detection of tree health pests and pathogens. Funded in the UK through the LWEC Tree Health and Plant Biosecurity Initiative (THAPBI).

241 two years, with only a few new individuals continuing to come forward. Our database of  
242 stakeholders showed that some individuals held multiple roles and that a stakeholder might  
243 be listed as an interested individual or as a representative of a relevant organisation, with  
244 'representation' not always being official. Individuals held relevant roles at local, regional  
245 and/or national scales. The diversity of types of stakeholder in the database was high, ranging  
246 from specialist inspectors with statutory and professional interests in tree health, to members  
247 of the public with relevant interests in, for example, gardening (see Figure 1). Our focus in  
248 this project was on engagement of stakeholders with a more clearly defined role in using  
249 technologies, such as inspectors, foresters and horticulturalists. Our aim for stakeholder  
250 engagement was to create a Learning Platform (Marzano *et al.*, in press), similar to a Learning  
251 Alliance (Sutherland *et al.*, 2012). We made opportunities for co-design, learning, and  
252 exchange through annual workshops using innovative tools such as Dragon's Den, Pecha  
253 Kucha, a technology fair, videos of research in the field, visioning and group discussions. We  
254 also encouraged Socio-technological Learning Laboratories (SLLs) at which the project team  
255 met key stakeholder groups in their places of work (for example Heathrow airport,  
256 Southampton docks, nurseries) to develop better understandings of technology needs and  
257 constraints in practice.

258 We developed a detailed Stakeholder Analysis and Engagement Plan Template (SAEPT) for  
259 project scientists to record stakeholder engagement. Finally, we (RMW and MM) undertook  
260 one or two semi-structured interviews with each leading technology scientist (N = 10 in total)  
261 and with a broad range of stakeholders including individuals from public and private sector  
262 forestry, conservation, industry (specifically nurseries), policy, and community woodlands  
263 (N=21). Questions tackled project engagement as well as barriers and opportunities for the  
264 use and development of technologies. Interviews (30-90 minutes) were professionally  
265 transcribed and coded using both inductive and deductive coding against themes and  
266 stakeholder group. Interviews were coded as scientist (S) with each individual allocated a  
267 number and each interview a letter (hence S1a to S7b) or stakeholder (SH), hence SH1-SH21.  
268

269 The second project, PROTREE, aimed to measure the variability and adaptability of trees to  
270 pests and diseases, and to find ways to get people involved in healthier pine forests. The  
271 project focussed on three important threats to Scots pine: *Dothistroma* needle blight, the

272 pinetree Lappet moth (*Dendrolimus pini*) and pine pitch canker (*Fusarium circinatum*)<sup>2</sup>. A key  
273 part of the project was to ensure the research addressed the needs of stakeholders and  
274 produced practical results that could be implemented on the ground. As such, research was  
275 undertaken to assess the values and understandings that stakeholders assigned to Scots Pine,  
276 management of its threats, and options/barriers to changing practices. We also mapped the  
277 socio-cultural, political, economic, and environmental contexts influencing how different  
278 stakeholders understand and make decisions by assessing the values and trade-offs  
279 motivating choice. Following a detailed stakeholder mapping (similar to the Detection  
280 project) and assessment of current policy frameworks, the project created a Science-Policy-  
281 Practitioner Interface (SPPI) for increased dialogue, knowledge exchange and validation of  
282 project activities and outputs.

283

284 Three focus groups were carried out in December 2015 with policy and societal actors with  
285 an interest in tree health. The focus group participants were policy actors with an interest in  
286 tree health in the Scottish context who had been invited to a workshop to inform on progress  
287 of the PROTREE project. The aim of the three focus groups was to discuss the understanding  
288 of the term 'resilience' in relation to tree pests and health. Each focus group discussion lasted  
289 15-20 minutes, included seven people and was facilitated by two of the authors (MM and JY)  
290 Following on from the focus groups the authors developed a semi-structured interview guide  
291 aimed at national level policy actors responsible for developing and/or implementing tree  
292 health resilience. Twelve high level policy actors in England, Scotland and Wales were  
293 identified and interviewed (March and-August 2016). The aim was to avoid duplication of  
294 work, and fill key knowledge gaps, namely the understanding of resilience among national  
295 policy-makers, the effectiveness of existing policy tools, and the current boundaries and social  
296 acceptability of different management options. All stakeholders interviewed had detailed  
297 knowledge at the national scale of the process of developing and/or implementing guidance  
298 on resilience in the forest sector. Semi-structured interviews were carried out by two of the  
299 authors (JY and MM). All interviews, excepting one, were carried out over the telephone.  
300 Interviews took between 25-60 minutes and were transcribed in their entirety. Results were

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<sup>2</sup> PROTREE: <https://wiki.ceh.ac.uk/display/THI/The+Project>. Funded in the UK through the LWEC Tree Health and Plant Biosecurity Initiative (THAPBI).

301 coded in NVivo 9 using a grounded theory approach (Starks and Trinidad 2007) in which issues  
 302 raised by participants were organised following the general themes of the interview guide.

303 **Table 1.** Distribution of PROTREE interviewees according to background.

INTERVIEWEE GEOGRAPHIC FOCUS	NUMBER OF INTERVIEWEES	INTERVIEWEE CODES
ENGLAND	5	PE1-PE5
SCOTLAND	4	PS1-PS4
WALES	1	PW1
CROSS-BORDER	1	PCB1
<b>TOTAL</b>	<b>12</b>	

304  
 305 We present the results from stakeholder engagement in these two projects below, addressing  
 306 the aims of the paper in drawing out lessons on with whom, why and how we should engage  
 307 with stakeholders across spatial, temporal and governance scales to support tree health and  
 308 how we prioritise engagement to obtain value in a time of resource constraints.

309  
 310 **Results and discussion**

311 *With whom should we engage?*

312 In both projects we identified a wide range of possible stakeholders. These varied from people  
 313 with professional and immediate interest in the research (e.g. inspectors in Early Detection  
 314 Learning Platform Project; forest managers in the PROTREE project) to diffuse groups such as  
 315 gardeners and recreational cyclists, to ‘the public’ (engaged in the PROTREE project). It was  
 316 clear that certain stakeholders had a greater responsibility and interest than others. For some,  
 317 there was a strong professional obligation to be aware of specific developments in tree  
 318 health; for those stakeholders with less interest and responsibility, there was a need for the  
 319 forestry and biosecurity professionals to engage them for general awareness and engagement  
 320 in plant security, although there were existing wider interests in woodlands and forests in  
 321 relation to culture, heritage, place and activity.

322 The nature of the Early Detection project was to engage stakeholders in technology  
323 development, therefore self declaration of interest was a major aspect of stakeholder  
324 identification and it was not appropriate to carry out a formal stakeholder analysis beyond  
325 that undertaken by Dandy *et al.* (2017) and Marzano *et al.* (2015). This project did not aim  
326 to establish a stakeholder management group, hence we were less concerned about ‘power’  
327 in our stakeholder identification than we might have considered for the establishment of a  
328 formal coalition. However, knowledge, experience and representation were considered  
329 critical in stakeholder identification. New stakeholder groups emerging included research  
330 and commercial funders. Engagement was focused more around roles and sectors than  
331 locations and spatial scale, although there was explicit emphasis on trying to obtain Scottish  
332 and Welsh representation as well as English perspectives. We had no engagement  
333 specifically with stakeholders from Northern Ireland or the Republic of Ireland (across the  
334 island of Ireland) in this study. Whilst we acknowledge their relevance, the separated land  
335 mass (creating a barrier to some pest spread) and partially devolved biosecurity practices  
336 create a slightly different context with regards to tree health. However, whilst we focused in  
337 this project on specialist groups of stakeholders for the Early Detection project, our  
338 participants suggested that the public does have influence in affecting and implementing  
339 tree health measures. One Early Detection participant commented that *“You know there  
340 almost seems to be the campaigns aimed at the professionals behind the scene, yet the  
341 greatest influence is always with the public”* (SH11). Certain key groups proved hard to  
342 engage; one Early Detection participant noted that: *“...Industry engagement is quite difficult  
343 because you do find that time is very precious to industry people and unless they can see  
344 some pounds in it for them, their engagement is always going to be limited”*. (S7a)

345 We had anticipated issues around representation (Davies and White, 2012), with individuals  
346 perhaps not being representative of particular organisations or institutions, but in fact the  
347 situation was much more complex than this. Firstly, the Early Detection project identified  
348 several individuals with long careers in forestry, moving between roles and organisations and  
349 therefore pollinating new positions with knowledge and experience from previous roles. This  
350 meant that individuals could not be associated only with one organisation (eg SH5). Whilst  
351 some individuals were specialists, others were recognised for a valuable breadth of  
352 knowledge. One Early Detection participant commented that, *“We need people who are GPs*

353 *[general practitioners], who have got a wide knowledge across a wide range of fields, who can*  
354 *spot the symptoms and point people to the right specialists. And we need the specialists as*  
355 *well” (SH15). They suggested that we had less generalists now than in the past.*

356 Secondly, although the field of tree health and the stakeholder database was complex and  
357 wide ranging, there was a degree of ‘who you know’ evident, with a common core of  
358 individuals recognised to be experienced and well connected and who interacted across  
359 different organisations.

360 Thirdly, organisations were more hybrid and complex than anticipated. Few stakeholder  
361 groups could be clearly defined, nor could their spatial and governance influence be bounded.  
362 For example, one Early Detection agency participant declared “*we are the Government’s*  
363 *expert on forestry matters” (SH5). There was not a binary separation between academic*  
364 *researchers and agency practitioners, because some agencies also undertake research, such*  
365 *as “[x Organisation], who are my experts, if you like”, said the same Early Detection*  
366 *participant. In some cases organisations spun off into other organisations over time, creating*  
367 *a dynamic network of organisations rather than a static arrangement of structures. For*  
368 *example, one Non Governmental Organisation (NGO) was associated with the development*  
369 *of another active NGO and associated social initiatives. In other cases the organisation was so*  
370 *large that one individual could not respond on behalf of all sections. An Early Detection*  
371 *participant commented that: “we are quite a big organisation..... so what it might identify is*  
372 *that there are other colleagues it would be worth you speaking to to get a fuller picture” (SH1).*  
373 However, despite this complexity, some organisations maintained more internally consistent  
374 views on tree health. PROTREE participants stated that certain organisations each had “*a*  
375 *common vision [...] working together” within the organisation. In some cases a stakeholder*  
376 *was not who they appeared to be on first contact. For example, one forest appeared to be*  
377 *owned by a public body, but when pursuing permission to work in this forest, one Early*  
378 *Detection participant reported that several enquiries were required to track down the*  
379 *landowner: a ‘woodland management company’ (SH15). In other words, some environmental*  
380 *goods (forests) were actually leased out, sub contracted and managed separately very much*  
381 *in line with neoliberal, market driven goals. This form of woodland governance differs widely*  
382 *from the notion of community woodlands described by other participants (eg SH2).*

383 The lack of specific roles linked to specific locations complicates the implementation of multi-  
384 level governance, but at the same time ensures a stronger structure, since levels are not  
385 wholly separated, but are bridged by organisations or individuals acting at more than one  
386 level.

387 Fourthly, there were existing interactions, fora and groups at which stakeholders already  
388 interacted and met, creating a network of groups overlaid on the suite of organisations. The  
389 Landscape Institute (the professional body for landscape architects in UK) was an example of  
390 an umbrella organisation identified as important by Early Detection participants (eg SH5). The  
391 Scottish Tree Health Advisory Group, including Forestry Commission Scotland, Scottish  
392 Natural Heritage, Woodland Trust, CONFOR, the Landscape Institute and local authorities,  
393 was an example of good organisational level engagement mentioned by PROTREE  
394 participants. However, these networks were not always proactive in pursuing tree health. An  
395 Early Detection participant complained that *"...I find it really frustrating that somehow nobody  
396 has taken a lead in terms of providing that concerted practical guidance for managing some  
397 of these issues, in a way that they should have done. .... So...I really would like to see some of  
398 the relevant professional bodies getting actively involved with that"* (SH10). Such networks  
399 enable stakeholders to develop trust and relationships and share knowledge horizontally, as  
400 a precursor to engagement by those concerned specifically with tree health.

401 Finally, participants themselves asked for wider circles of interaction, suggesting in the  
402 PROTREE project that we should see further engagement with *"the people collecting the seed,  
403 the people growing the trees, the NGOs who might be supplying those and the major  
404 landowners, [.....] for example"* (PE1).

405 There were some stakeholders who were not successfully engaged during these projects.  
406 Whilst the Early Detection project did attempt to engage with nurseries and tree suppliers, it  
407 was suggested that these stakeholders had not been sufficiently engaged by tree health  
408 initiatives in the past, limiting the potential for biosecurity response and resilience. The  
409 PROTREE project found that *"you've got to engage with industry to be able to gather the  
410 necessary data to say first of all that there is a significant level of trade and secondly, that  
411 there is a known threat associated with that trade."* (PCB1). Other missing PROTREE  
412 stakeholders were those on the agri-environment side: *"I do know from discussions with  
413 colleagues that there seems to be a bit of a gap in our knowledge of agri forestry schemes like*

414 *where are they, what's being planted there?"* (PE1) and small woodland owners: *"there's such*  
415 *a huge number of small woodland owners, some of whom have woodlands on their land that*  
416 *they don't really engage with and others are happy being with their small bits of woodlands,*  
417 *messing around with it as it were, getting on with what they want to do. But I do think it's*  
418 *very hard for them to engage, there's so much regulation on woodlands and I know that*  
419 *landowners complain a lot about that."* (PE5) Hence we can see that stakeholders can be  
420 defined not only as individuals, as organisations and by spatial scale of influence, but also by  
421 sector. A caveat identified in the PROTREE project was that the identification of stakeholders  
422 *"partly depends on the particular area of focus [...] But it is also thinking about who's best*  
423 *placed to deliver and to act on some of these things."* (PE4)

424 Even from stakeholders themselves the issue of not engaging with all possible stakeholders  
425 emerged from an agency respondent in the Early Detection project: *"In terms of my*  
426 *experience of working on projects themselves...I think it's quite important that you make sure*  
427 *that the number of stakeholders involved is appropriate..."* because dealing with more  
428 stakeholders increased *"the number of tangents that you can go off with"* that could not be  
429 addressed within the particular project underway (SH10). There was thus a sense of needing  
430 to engage stakeholders to understand different perspectives but also of realizing that too  
431 many diverse views could detract from the task at hand.

432 This analysis of who we should engage thus identified the complexity of individuals layered  
433 over organisations, multiple roles, and an endless set of ever widening circles of people,  
434 indicating *potential* but not *priority* stakeholders. The last point perhaps begins to suggest a  
435 strategy: that we develop and invest in a stakeholder map for the field of tree health, update  
436 this regularly to capture movement of individuals and the emergence of new organisations  
437 and networks, but that we target stakeholders and particular networks for particular issues.  
438 We thus develop long term investment in general engagement and short term intensive effort  
439 in particular engagement. This strategy is supported by previous research (Dandy *et al.*, 2017),  
440 but we emphasise that a balance should be maintained despite resource constraints.

441 A further question emerging from discussion of whom we should engage is who is doing the  
442 engaging? Government has a responsibility to engage stakeholders around particular issues  
443 and indeed this forms part of their strategies (DEFRA, 2014). However, such responsibilities  
444 are sometimes devolved to collaborations, networks or management groups, a common

445 strategy of State fallback evident in the neoliberal era (Davies and White, 2012). In the field  
446 of tree health, for example, the Tree Health Advisory Group could seek more diverse and  
447 particular forms of engagement in response to specific contexts and engagement  
448 requirements. As stated above, the division between academic researcher and government  
449 practitioner is not clearcut. Our teams included university academics, academics from  
450 research centres partially funded by government and researchers from partially funded  
451 agencies, with practitioner organisations represented on expert advisory groups. Our project  
452 goals were practical as well as seeking new theoretical understandings of tree health  
453 management. The potential problem of stakeholder engagement only for research and not  
454 for practical outcomes was thus at least partially ameliorated. However, a different issue  
455 emerged in that stakeholder engagement is often associated with projects rather than  
456 people. Early Detection participants commented on the challenges of project specific  
457 engagement: “ *continuity is important.... Otherwise ....what happens is these projects come*  
458 *and go, and nothing materialises*” (SH8). On the other hand, sometimes engagement was  
459 intended to be project specific but actually for Early Detection researchers there was some  
460 continuity: “ *quite often it’s not even, not necessarily a nice discreet project. You know things*  
461 *overlap and you end up combining experiences from several projects*” (S5a). The resource and  
462 knowledge constraints for individual academics seeking stakeholder engagement will be  
463 discussed below.

464 In some cases engagement was seen to be a shared responsibility, and would be undertaken  
465 not only by researchers, government or agencies but also by relevant NGOs. In the PROTREE  
466 project it was noted that: “ *there’s a lot of community woodlands out there now, you’ve got*  
467 *NGOs like the XX doing a sterling job of handing out tree packs to schools, to small woodland*  
468 *groups, we get them free, they’re brilliant. They do some of the work for you so obviously*  
469 *they’re now doing more of the behind the scenes biosecurity, they’re doing some of the work*” .  
470 (PE1)

471

## 472 **Why engage with stakeholders?**

473 As described above, stakeholder engagement can strengthen environmental management  
474 through instrumental, substantive and normative outputs (Blackstock *et al.*, 2007). In the

475 Early Detection project, instrumental outputs included modifications in technology  
476 development (Marzano *et al.*, in press). Instrumental consequences identified in the PROTREE  
477 project included improved decision-making, especially through engagement with people who  
478 might not necessarily agree with decisions taken: *“you need somebody at the other end of the*  
479 *spectrum to say “Why are you doing this?” you know, otherwise you get the wrong decisions.*  
480 *I mean, I’ve always been a believer, to get the right decisions, you need advocates at both*  
481 *ends of the spectrum”*. Another instrumental aspect was considering potential for  
482 collaboration: *“it’s about thinking about where the strengths and opportunities will be within*  
483 *the stakeholder landscape and how we can best work together on those areas of interest”*.  
484 PROTREE participants also acknowledged that stakeholder engagement enables “joined up  
485 thinking” and can fill “gaps in our knowledge”.

486 Many PROTREE interviewees outlined the substantive nature of stakeholder engagement, in  
487 terms of enhancing buy in and enabling environmental strategy implementation. As one  
488 participant commented: *“You know, no matter how much you tell people or how much*  
489 *money you throw at it, it might not happen if they don’t want it to happen”* (PS2); another  
490 stated that *“you’re not going to find a solution that everybody thinks is marvellous but at*  
491 *least if everybody is bought into it, then you can go forward.”* (PS1) An Early Detection  
492 respondent also supported the need for engagement to increase buy in to appropriate  
493 biosecurity action: *“...I do feel really really strongly we should never ever shy away from*  
494 *doing the right thing... Once people are informed, and you talk to people and you actually*  
495 *explain what it’s all about, you know, 99% of people will be more than happy to accept that.”*  
496 (SH10)

497 There was less evidence of specifically normative consequences of stakeholder engagement.  
498 Stakeholders claimed social and knowledge benefits, and as we argued above, tree health is  
499 a societal concern, hence it might be argued that there is an indirect normative effect of  
500 engagement around tree health.

501

## 502 **How to engage stakeholders?**

503 One challenge mentioned by most interviewees was how best to engage, or as one PROTREE  
504 participant put it, *“how do you get all those people together?”* (PS2) Each project had diverse

505 and multiple modes of engagement with different stakeholders and for different reasons,  
506 with collective workshops, individual interviews, and innovative means of gathering cross-  
507 role groups for knowledge sharing. The projects thus spanned much of the participation  
508 spectrum (Arnstein, 1969). However, resource constraints were cited at all levels of  
509 engagement.

510 Even information provision and awareness raising efforts were seen to be important and  
511 difficult to design effectively. One PROTREE interviewee mentioned that *“the real challenge*  
512 *is to ..... come out with simple messages, not simplistic messages, before you go out wider”*  
513 (FG1). ‘The message’ about tree health was seen to be important; priorities for one PROTREE  
514 participant were *“have the organisations getting the clear message and having the resources*  
515 *to do it”* (PS3). ‘The message’ was expected by a PROTREE participant to derive from  
516 government, so that, *“there has been probably a lead from government but then*  
517 *organisations pick them up and they retweet them or reinforce the messages and try and get*  
518 *the messages over to their members”* (PS1).

519 The timescale between engaging people to increase awareness level and changing behaviours  
520 was questioned. One PROTREE participant warned, *“It’s the same as public awareness .... It*  
521 *might well have turned the corner and people are starting to change behaviour, but anybody*  
522 *who thinks it’s going to happen overnight is [in]...cloud cuckoo land!”* (PS2).

523 Attempts to engage more at the empowering end of the participation spectrum were not  
524 always welcome. One PROTREE participant commented that, *“people want to be told what to*  
525 *do – that’s the problem we’ve got”* (PS2). In part, reluctance to ‘be empowered’ and take  
526 more control of tree health in some areas may be due to structural issues, resource  
527 constraints or a lack of knowledge. For example, another PROTREE policy stakeholder and  
528 woodland owner felt that there was a definite need for improved knowledge exchange on  
529 forestry in terms of resilience, *“gaps are forming and there isn’t that kind of body or that*  
530 *group or that mechanism for transferring information and putting things into practice”* (PE1).  
531 The source of knowledge was seen to be critical.

532 Another PROTREE participant mentioned the importance of peer to peer networks, as well as  
533 individuals championing ideas and concepts: *“I actually think that those peer to peer networks*  
534 *are more influential than anything else. A member of my previous team [...] has been*

535 *incredibly influential because basically .... he's been quite passionate about it and that's*  
536 *probably the most influential thing that's happened"* (PE2). This participant also said that *"the*  
537 *availability of trusted advice was really important and what your peers were doing was also*  
538 *really important"*.

539 It was not only important who exchanged knowledge but also how. In the Early Detection  
540 project it was commented that face to face interaction was useful to facilitate exchange and  
541 also clarify 'the message': *"I would always encourage a dialogue ... if you think it's important*  
542 *for stakeholders to buy into something, rather than just you know sort of another email,*  
543 *because it is sometimes difficult to pick out the really important stuff"* (SH10). It was  
544 suggested that *"... sometimes a phone call is just so much better, cos you can express .... a*  
545 *subject or a topic...in a lot more detail and you can grasp that relevance, just from the*  
546 *conversation than you can in e-mails"* (SH5). However, modern technology still makes  
547 dialogue possible, for example, when travel across areas for face to face meetings is difficult.  
548 One Early Detection participant commented that *"we video conference here all the time"*  
549 (SH10).

550 One PROTREE participant did acknowledge the importance of more collaborative governance  
551 as opposed to top down initiatives: *"something that is co-designed, that we work in*  
552 *partnership, it's co-delivered. These are problems that are collectively owned and it's*  
553 *important that we have collective solutions for those, and in order to develop those collective*  
554 *solutions it's absolutely critical that we work in partnership"* (PE4). Within this vision, there  
555 was a role for government, in terms of *"setting out at a national level using the different levers*  
556 *that we're best placed [...] to use in terms of thinking about government's role in terms of*  
557 *facilitation capacity and that type of thing."* (PE4). The same participant also emphasised the  
558 need for multiple perspectives and partnership in such a process: *"But it is, very much a case*  
559 *of needing to look at this issue from multiple different perspectives and understand how best*  
560 *we can collectively collaborate to deliver..... By doing it that way it will be about co-owning*  
561 *the issues and then co-developing the solutions, and tapping into the right expertise that's*  
562 *available."*

563 Our two research projects analysed here expanded the modes of engagement normally used  
564 by government. Participants applauded some of the practical engagement approaches and  
565 tools, such as, in PROTREE, *"conferences, meetings, discussions is a really new way and I think*

566 *it's probably undervalued within the government sector"* (PE5). The same participant  
567 positively commented on joint fieldtrips whilst discussing the concept of resilience in forestry:  
568 *"having seminars and conversations and chats and standing in a wood and looking at it*  
569 *together and talking, so that that idea can evolve"*. In the Early Detection project, several  
570 participants praised the attempts to create innovative interactive activities within workshops  
571 and it was commented that some of them were even 'fun' (e.g. rapid marketing pitches  
572 following the format of a popular television programme).

573 There was also the issue of tailoring engagement to different stakeholders in PROTREE: *"if*  
574 *you're a member of the general public ... do you actually care whether it's oak, beech,*  
575 *sycamore or do you just care that there's trees there and actually what you don't want is the*  
576 *trees to be chopped down?"* (PE1). Guidelines need to be repeated and maintained; they  
577 cannot be delivered once and then engagement be 'ticked off'. One Early Detection  
578 participant commented that *"I think it's just a case of keep churning that stuff out, you*  
579 *know..... So the kind of very basic 'these are the things, these are some of the major pests,*  
580 *this is what to look for, this is who to talk to', and have a really clear sort of you know, a)*  
581 *pictures of what to see, and b) contact details for what you do if you find it"* (SH2).

582 For forest managers, one PROTREE participant suggested *"early engagement with them in*  
583 *understanding what their challenges are and how they operate is essential if you're going to*  
584 *design, say you're going to redesign your woodlands to make them more resilient"* (PE1). In  
585 the Early Detection project, certain stakeholders were engaged through visiting or  
586 interviewing them rather than expecting them to attend conferences; particularly commercial  
587 stakeholders, for example, plant nurseries and forestry consultants.

588 Hence we see that the most effective ways to engage stakeholders vary, with engagement  
589 across the participation spectrum being important. Whilst effective awareness raising  
590 schemes are critical, and we need to acknowledge that they take time to have effect, it is also  
591 important to facilitate more empowering forms of engagement through co-design and co-  
592 production of solutions. However, such intensive forms of engagement require resources and  
593 structural compatibility, including mechanisms to produce and share knowledge effectively.  
594 Engagement should itself be seen as a process of knowledge exchange rather than one way  
595 information provision, but knowledge will be more likely to be accepted if the source of  
596 knowledge is trusted and particularly if disseminated by charismatic individuals. Engagement

597 can be facilitated by interactive and novel methods such as fieldtrips, conferences, and  
598 individual tools; and these methods should also permit time and space for critical reflection  
599 by all participants. Specific engagement methods may be required to reach different groups  
600 of stakeholders and the timing of engagement is important, for a stakeholder and within the  
601 wider context.

602 *What spatial and temporal scales of engagement were evident?*

603 Spatial scales of activity in the Early Detection project ranged from involvement only with one  
604 woodland, to regional positions in forestry, to devolved state roles (in Wales or Scotland) to  
605 national level responsibility with high levels of engagement with European partners, for  
606 example through the European Plant Protection Organisation. In the PROTREE project, there  
607 was also spatial variation from woodland to UK level.

608 Local connection to place was evident in expert volunteers within a citizen science activity, in  
609 which participants mostly lived close to or in the woodlands they were monitoring. These  
610 volunteers were loosely connected horizontally within the project and two indicated a  
611 request for deeper connection. There was concern voiced by some Early Detection  
612 participants about the lack of monitoring within specific forests; not merely scheduled  
613 scientific assessment but frequent, serendipitous observation, knowledge of place and  
614 presence in the woodlands: *“the old fashioned way... going and looking at things in a  
615 forest...community woodlands ... XX[organisation] has qualified foresters but they sit in X  
616 TOWN which is 10 hours’ drive away, and then come and look at the forest”* (SH2).

617 Scaling was a challenge within organisations, with some organisations themselves being too  
618 big to capture or focus on issues of major concern in tree health as identified by Early  
619 Detection participants: *“XX organisation is so big... the trees are such a tiny part of it”* (SH10).  
620 The challenge appeared to be less the size of organisations or scale, but rather the ability to  
621 coordinate and effectively share knowledge: *“the other thing I think is frustrating is a lack of  
622 consistency between government organisations in terms of their approach to managing some  
623 of these things [tree pests]”* (SH10).

624 Temporal scale was noted mainly in terms of the long timescales taken to achieve goals, such  
625 as behaviour change as discussed above, but also practical outputs. In the Early Detection  
626 project, one researcher was slightly frustrated by expectations of stakeholders: *“if you are*

627 *truly serious about this technology, you have to understand the timeframes*” (S7a). Whilst  
628 stakeholders emphasised both short and long term goals and decision making needs in tree  
629 health, there was less discussion of investment in relationships and collaborations for the long  
630 term and more comment on the need for immediate knowledge exchange. Temporal aspects  
631 were also evident in the recognition of the need to continually repeat communication and  
632 messages to certain audiences. For example, an Early Detection participant said that: *“you*  
633 *can never keep saying those things [basic tree pest information] too often”* and suggested that  
634 *“it's the sort of [message]...that [X network] need to keep pumping out to their members and*  
635 *so on”* (SH2).

636 It was evident during the Early Detection project that scaling occurred within the research  
637 context as well as within stakeholder engagement, creating an overlay of projects (such as  
638 Early Detection or PROTREE), programmes (such as THAPBI) and regulations (such as statutory  
639 requirements around imported tree quarantine) within which stakeholders were engaged at  
640 different governance and temporal scales. Projects and programmes were often shared  
641 across partners of different types, academic and non-academic, commercial and public sector  
642 (eg SH1) so *“you end up combining experiences from several projects”* (S5a).

643

644 *What resource constraints to engagement were cited?*

645 Our premise was that whilst stakeholder engagement was advantageous, there would be  
646 resource constraints limiting the type or extent of engagement not only within our projects  
647 but also more widely for the organisations involved. Indeed, participants confirmed this  
648 perspective. One Early Detection project team member indicated that *“it seemed that nobody*  
649 *had the time”* of the stakeholders we tried to involve around technology based SLLs. Cost and  
650 resource constraints were mentioned by Early Detection participants with regards to tree  
651 health management: *“diminishing resources and diminishing available money”* (SH9) and *“we*  
652 *have a fixed budget... so it will be about prioritising [for early detection]”* (SH9). There was  
653 some despair: *“I was in the cost cutting scene in the middle of a development plan”* (SH13)  
654 but cost was also seen as an accepted and obvious constraint: *“You have an issue of cost*  
655 *obviously.....price would be important, and also accessibility”* (SH1) and specifically in relation  
656 to detection technologies: *“it's all going to be down to cost, accuracy with it”* (SH12).

657 In some cases there was disagreement amongst stakeholders over the use of limited  
658 resources. One Early Detection participant said, *“seven million [pounds]! I think, ooh, that’s a  
659 lot of Rhododendron clearance for that!”* (SH12). There was recognition in the Early Detection  
660 project of the need for accountability and value from the limited resources: *“what’s the  
661 greater good .... for the public ...?”* (SH12); *“it’s where you get your value for money, isn’t it?”*  
662 (SH12). In some cases the resource available was not fully matched to the implementation  
663 requirement across governance scales: *“the plant health... activity is devolved to us but the  
664 budgets are not”* (SH13).

665 Resource was not only about money but also personnel, as discussed by a participant in the  
666 Early Detection project, *“I think we only had something like eight or ten people in the tree  
667 health team, and they are down to four now..... they’ve sort of been scaled down so much”*  
668 (SH13). People are not all seen to be of equal utility or merit when it comes to resource for  
669 tree health. Whilst it was suggested in the Early Detection project that community members  
670 could help monitor tree health *“there is a resource there of people, doing you know, in the  
671 woods interested about the trees and then willing to look at them and report what things they  
672 might see”* (SH2) there was also scepticism from stakeholders about the capacity of  
673 community members to spot a healthy tree and therefore a diseased tree

674 A challenge identified by a PROTREE participant was that even if identified, not all relevant  
675 stakeholders might be able to engage, and stakeholders had to prioritise decisions to engage  
676 and to subsequently act on tree health based on resource, time and interest: *“I’m sure there  
677 will be some groups that it will be difficult to engage with. I think there’ll be a range of issues  
678 as to why it will be difficult to engage with us, and those issues will be around competing  
679 priorities, competing resource constraints, all of those types of things”* (PE4). Another  
680 interviewee identified the same problem: *“you need to engage with those people and try and  
681 help them to understand what would be really good and again, you can tell them, you can’t  
682 make them but you can try and engage their interest and hope that somebody who wants to  
683 own a woodland cares something about the woodland”* (PE5).

684

## 685 **General discussion**

686 *Prioritising stakeholder engagement outcomes*

687 Public participation and stakeholder engagement for environmental planning can deliver  
688 many benefits, strengthening the value base of decision making, reducing conflict, and  
689 increasing trust in each other and in the public agency (Beierle and Konisky, 2000). In this  
690 study and in related papers from the projects concerned, we document various benefits of  
691 stakeholder engagement as described by Blackstock *et al.* (2007): instrumental (such as  
692 technology adaptations), substantive (better understanding, relationships) and normative  
693 (enhanced trust and understanding) (Marzano *et al.*, in press); Young and Marzano in review,  
694 this special issue). However, it is not clear how engagement can be better fostered and  
695 facilitated and which outcomes can be prioritised. The long term results from some activities  
696 discussed above (e.g. changing behaviour, technology deployment) indicate that the  
697 normative outcomes, generating trust and understanding, should not be neglected in favour  
698 of more instrumental approaches, as have been favoured to date by state initiatives around  
699 tree health (Dandy *et al.*, 2017). Whilst it takes resources to create face to face or interactive  
700 engagement opportunities and to build relationships, the rapidity of movement of individuals  
701 across roles outlined in our projects means that such efforts may be limited if they are too  
702 directed. There thus needs to be an overlay of networks.

### 703 *Prioritising means of engagement and stakeholders*

704 Our project participants recognised the value of awareness raising, and described how ‘the  
705 message’ (such as a particular caution or action) could be cascaded within and from groups  
706 and organisations. Perhaps paradoxically, it thus seems advantageous to invest limited  
707 resources in the development of networks and knowledge exchange opportunities and then  
708 to pursue and encourage the dissemination of clear messaging around an environmental  
709 issue. The mode and extent of stakeholder engagement has changed dramatically over the  
710 past 20 years, and engagement is now less by the state and more by other actors. The  
711 tendency for reduced government and agency staff and the combination of centralised  
712 control and devolved responsibility cited by our participants demonstrate a more complex  
713 picture for multi-level governance than we initially painted. ‘Government’ is present at  
714 multiple scales and in hybrid forms, and large NGOs, agencies and commercial entities also  
715 contribute to governance across multiple spatial scales. This creates increased pressures for  
716 stakeholder engagement but with less capacity and resources.

717 It may be that engagement will be made through more strategic alliances. The difficulty lies  
718 in prioritising immediate benefits versus investment in alliances that support longer term  
719 partnerships but with unknown future returns on investment. Such decisions are more  
720 difficult when such alliances have to balance institutional emphasis (e.g. on a role) with  
721 support for personal relationships and the building of trust.

722 Communication technologies have vastly changed, enabling rapid cascading of ‘the message’  
723 via social media across organisations and their constituencies and facilitating video  
724 conferencing and other dialogical exchange within and across organisations. This shift from  
725 boots on the ground in the woods to video conferences, video clips and social media tweets  
726 offers potential to greatly amplify communication. Such campaigns and practices enable  
727 individuals and local groups to opt into action through interest and choice; personal as well  
728 as institutional engagement is thus important. However, despite the critical role of modern  
729 communication technologies in stakeholder engagement, fieldtrips, face to face meetings and  
730 interactive activities were still seen to be critical engagement methods. These approaches  
731 should thus not be replaced only by social media and other technological messaging methods.  
732 In addition, it is not always clear that ‘the message’ can induce real change where it is  
733 required.

734 The issue of who to engage is also now more complex, because organisations span  
735 governance levels, organisations are often hybrid in form and existing networks have formed  
736 that can be included and contribute to engagement efforts. In this project, we also highlighted  
737 that in tree health the entities seeking stakeholder engagement are no longer clearly defined.  
738 Stakeholder engagement in relation to tree health is desired by government, by advisory  
739 groups or networks, by researchers and by agencies. ‘Researchers’ are no longer merely  
740 academics removed from practice and situated in an ‘ivory tower’, but can also be embedded  
741 in government, agency, NGO, commercial and hybrid organisations and institutions.  
742 Engagement by individuals and organisations is further complicated by the projectscape –  
743 overlapping, sometimes discontinuous projects across multiple organisations that may target  
744 more specific or more general aspects of tree health or other environmental issues. The  
745 general shift towards a more participatory form of knowledge production (Gibbons *et al.*,  
746 1994) also enables a more nuanced landscape of stakeholders and activities. However,  
747 despite the positive aspects of engaging non-academics in research and research application,

748 we are reminded that when we seek participation we need to acknowledge and adapt to  
749 power differences to avoid creating or exacerbating inequalities (Kapoor, 2001).

750 Multi-level governance can emphasise horizontal or vertical relationships (Eckerberg and  
751 Joas, 2004). In tree health this means, for example, maintaining horizontal learning  
752 opportunities across regional tree health managers' meetings; retaining inspector specific  
753 fora; and creating local learning groups within the overall learning platform as well as vertical  
754 linkages across local, regional and national levels. In practice, the contemporary focus on  
755 projects demands that project engagement processes be linked and collaborative, whether  
756 these projects deliver research, practice or both kinds of outputs. Such vertical and horizontal  
757 engagement can highlight tensions between, firstly, representative democracy and, secondly,  
758 partnerships and deliberative forms of democracy that must be managed (Eckerberg and Joas,  
759 2004).

760

#### 761 *Prioritising stakeholder engagement in an era of austerity*

762 Our results show that state is keen to pass on responsibility to community and other non-  
763 governmental groups; but these groups cite a lack of knowledge and capacity. We agree with  
764 Davies and White (2012) that we need resource to invest in 'empowerment' and building  
765 capacity.

766 The era of austerity not only creates resource limitations, overburdens staff and impacts on  
767 time for task completion, but also is characterised by an audit culture. The demand for  
768 accountability and appraisal is intended to deliver increased productivity, value for money,  
769 efficient management, and transparency. However, this can clash with a culture that  
770 promotes the facilitation of serendipitous encounters, adaptive approaches and mutual  
771 learning, creating a paradox for managers (White, 2004). Participation is a shift towards  
772 decentralised, community oriented, diverse perspectives forms of environmental  
773 management (Kapoor 2001), yet we see environmental management increasingly influenced  
774 by the pressures of neoliberal practices, making it more difficult to maintain participation. It  
775 has already been suggested that government may favour instrumental outcomes from  
776 stakeholder engagement (Dandy *et al.*, 2017) and there is thus a risk that the substantive and  
777 normative outcomes of engagement will be reduced. 'Value for money' should include an

778 appreciation of the benefits of capacity building, investment in partnership, institutional  
779 memory and processes (Meagher *et al.*, 2008). There is a need to also value learning, trust  
780 and relationships as the basis for effective current and future interactions. However, whilst  
781 participation can build trust and reduce conflict, in practice it is often small groups engaged  
782 without good representation across wider socio-economic bands and possibly excluding  
783 those with strongly conflicting views (Beierle and Konisky, 2000).

784 There is a view that stakeholder participation should be institutionalised (Kapoor, 2001; Reed,  
785 2008). As described above, we need to move beyond separate institutional fora towards a  
786 learning platform across which knowledge can be exchanged and engagement facilitated as  
787 new projects or problems emerge. This more nuanced view is representative of the  
788 epistemological shift required in environmental management as we move towards more  
789 democratised, interactive and adaptive modes of environmental science and management  
790 (Gibbons *et al.*, 1994; Costanza, 2003; Carolan, 2006).

791 In this contemporary framing, the role of those engaging has also changed. This study  
792 highlighted the hybridity of roles of individuals and within organisations, including agency  
793 staff/researcher, researcher/activist. Whilst such hybridity aligns with shifts from government  
794 control to democratic governance, learning platforms were said by our participants to require  
795 resourcing. Statutory requirements for engagement and collaboration have been shown to  
796 require governmental support (Davies and White, 2012). This study demonstrated that NGOs  
797 can contribute to awareness raising and engagement, but they will not do so unless it aligns  
798 with their topics of interest. Hence we need to consider who resources the learning platform  
799 described above and how this is undertaken. For example, supporting networks and events  
800 such as annual conferences would be an effective use of funds to underpin shorter term  
801 specific engagement needs. In this way we can rethink stakeholder engagement as, firstly, a  
802 network of people, policies and practices; secondly, as an essential thread linking cycles of  
803 knowledge production (through research and in practice), exchange (research dissemination,  
804 capturing TEK, knowledge integration, translating knowledge into policy) and implementation  
805 (management); and, thirdly, as a mechanism for deliberative decision making. In this way  
806 stakeholder engagement moves beyond project specific functionality towards the support of  
807 communities of practice (Wenger and Snyder 2000) and of social learning as well as skills and  
808 information exchange.

809 Supported by this learning platform, we would have specific stakeholder engagement  
810 processes. In each case it may be useful to explicitly outline who is engaging, why and how;  
811 how engagement will change over the stage of the project/programme/initiative; what length  
812 of time is envisaged for the initial process and for the maintenance of ongoing engagement  
813 (ie lifespan and interlinked engagement across projects). In line with Reed (2008), we agree  
814 that it is important to define expected outcomes in a specific case, but we do not concede  
815 that aiming for empowering forms of participation at the top of Arnstein's ladder is always  
816 best; this depends on the required outcomes.

817 The role of 'the public' is interesting. Notwithstanding the fact that the public is a  
818 heterogeneous and poorly defined group, one participant felt that more effort engaging the  
819 public in general would lead to significant advances in biosecurity. Research projects rarely  
820 have more than a token impact on the public, and NGOs and government tend to undertake  
821 specific campaigns, but perhaps there is a role to engage more in school and tertiary  
822 education and in community settings. Galvanising 'the public' may also generate support or  
823 even lobbying for drastic biosecurity responses, such as those seen by (Porth *et al.*, 2015), and  
824 could allow us to think beyond today's needs to those of future generations.

825

## 826 **Conclusions**

827 We promote stakeholder engagement for the strengthening of both ecological and political  
828 literacies, for social learning and for the production, exchange and implementation of  
829 knowledge that can benefit tree health. However, we need to heed the warning that  
830 inappropriate participation can actually maintain the monopoly of capital, dominant western  
831 knowledge systems, and exacerbate social inequalities and biases (Kapoor, 2001). The current  
832 neoliberal context, incorporating fiscal austerity and audit control, cause us to re-define and  
833 more carefully plan and prioritise our stakeholder engagement. However, this study  
834 demonstrates the need to also integrate serendipitous encounters together with targeted  
835 learning outcomes. We thus see stakeholder engagement not as process of linear  
836 communication, but rather as creating a network of relationships, knowledge flow and  
837 decision making opportunities across a complex map of hybrid forms of stakeholders and  
838 within a complex projectscape.

839 We found that people prefer human interactions; whilst face to face communication is  
840 favoured, video conferencing can help facilitate collaboration, especially when reduced staff  
841 are situated further away from each other. Even telephone permits interaction, rather than  
842 one way delivery of information hidden within the email inbox. In order for engagement to  
843 be ranked as a priority by time-poor individuals, forms of engagement have to include fun,  
844 shared, experiential, relevant chances to exchange knowledge.

845 These approaches may deliver genuine stakeholder engagement rather than see a retreat of  
846 participation to offer lip service and gloss to decisions made by centralised, powerful bodies.  
847 We need further research to demonstrate the 'value for money' of investment in alliances,  
848 networks and communities of practice across hybrid forms of stakeholders in facilitating more  
849 successful forms of state devolution of responsibility. It is concluded that, despite economic  
850 austerity, investment is required to support relationships and networks, promoting normative  
851 and substantive forms of engagement and countering the audit culture, rather than focusing  
852 merely on instrumental, easily measurable, short term gains.

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