



**Biodiversity reporting for governmental organisations:  
Evidence from English local councils**

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## Biodiversity reporting for governmental organisations: Evidence from English local councils

### Abstract

**Purpose** – The purpose of this study is to analyse the current nature and content of biodiversity reporting practices adopted by English local councils. By adopting a multi-theoretical framework that relies on economic and social theories such as agency, stakeholder, legitimacy and institutional theories, this study also aims to investigate the factors that explain the extent of biodiversity disclosure provided by local councils.

**Design/methodology/approach** – This study uses a self-constructed disclosure index to analyse the biodiversity-related information published in the official websites of 351 English local councils. A multivariate analysis was conducted to analyse the association between local councils' characteristics and biodiversity disclosure.

**Findings** – This study shows that the information disclosed on local biodiversity is limited and does not allow the interested stakeholders to get a comprehensive picture of the current status of local biodiversity. It also provides evidence that the level of biodiversity disclosure is significantly associated with the level of local council's population, the presence of councillors from environmentally-oriented parties and environmental non-governmental organisations operating in the local council area, poor biodiversity management practices and local councils' visibility.

**Originality/value** – This study is one of the few accounting studies that provides a comprehensive analysis of biodiversity disclosure by analysing its nature and content and investigating the factors associated with such disclosure. It extends agency, stakeholder, institutional and legitimacy theories, by showing that local councils use voluntary disclosures to satisfy the informational needs of the main stakeholders and to assure that their strategies and practices conform to the values and expectations of the community they represent.

**Keywords:** Biodiversity, England, Local councils, Voluntary disclosure

## Introduction

Biodiversity is essential for the survival of the human race and plays a central role in economic development. Flora, fauna and ecosystems provide fundamental support to human well-being. Despite knowing about biodiversity's importance, humans have undertaken activities that contribute to ecosystem degradation resulting in biodiversity loss (Secretariat of the Convention on Biological Diversity, 2014). These losses in biodiversity have caused a decline in human well-being, with some social groups being pushed into poverty. Supranational organisations like the United Nations and the European Commission are developing strategies and action plans aimed at raising global awareness of biodiversity. These strategies, in particular, underline the need to integrate biodiversity considerations into organisations' accounting and reporting systems, in both the private and public sector (Secretariat of the Convention on Biological Diversity, 2010; EU, 2012). Organisations, as human constructs, should give an account of the impact of their activities on natural habitats and species and on the actions they have implemented to manage this issue (Jones, 1996, 2003).

Organisations need to be accountable for environmental assets to the society at large as well as to their stakeholders (Jones, 2013). Organisations have a moral duty to maintain, enhance if possible, but certainly not deplete the world's natural resources. They should act as stewards of the natural environment (Jones, 2003). This concept of environmental stewardship is very wide as it embraces not only current stakeholders but also the future generations of stakeholders. At its core is the principle that the current generation should pass onto the next generation natural resources at least equivalent to those inherited from the previous generation. Biodiversity accounting is one of the means that organisations can use to demonstrate their environmental stewardship. By accounting for biodiversity organisations can shape the way in which the impact of human activities on the biodiversity loss is perceived and understood by society (Jones and Solomon, 2013). In its broadest sense, accountability refers to the "giving and demanding of reasons for conduct in which people are required to explain and take responsibility for their actions" (Parker and Gould, 1999, p. 116). By reporting comprehensive information about the condition of the environmental assets they manage, the actions taken to conserve and protect them and the progress achieved, organisations discharge their accountability to the society. Biodiversity reporting allows the society and interested stakeholders to assess management's stewardship of the natural environment (Jones, 1996). Such public assessment, in turn, encourages organisations to adopt actions to conserve and protect biodiversity effectively (Jones and Solomon, 2013).

Despite this importance, biodiversity has been almost neglected in the accounting literature (see Jones and Solomon, 2013). There are few studies on biodiversity accounting, most of them address technical accounting problems of how to establish accountability mechanisms for corporations and how to account for biodiversity. These issues have generally been addressed theoretically, with the attempt to create a framework for biodiversity accounting (Davies, 2014; Houdet, 2008; Houdet et al., 2009; Jones, 1996; Tregidga, 2013), or with single case studies (Jones and Matthews, 2000; Jones, 2003; Cuckston, 2013; Siddiqui, 2013; Kahn, 2014). Biodiversity reporting has been the focus of recent studies, most of them focused in the corporate sectors (Adler et al., 2017, Adler et al. 2018; Atkins et al., 2014; Boiral, 2016; Gaia and Jones, 2017; Rimmel and Jonall, 2013; Samkin et al., 2014; Schneider et al., 2014; Van Liempd and Busch, 2013; Weir, 2018).

Governmental organisations have been generally neglected by the literature on environmental and biodiversity accounting, despite the fact that they are directly accountable to the public for delivering sustainable development (Ball and Grubnic, 2007). Governmental organisations have a historical role as a "steward of the environment" (Lewis, 2000). They have "a civic responsibility to properly manage public goods, resources, and/or facilities in a

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3 way that supports sustainable development objectives and promotes the public interest” (GRI,  
4 2005, p. 7). Biodiversity is a core component of a sustainable development and has an  
5 important role to play in developing sustainable communities. In England, the Natural  
6 Environment and Rural Communities Act places a ‘biodiversity duty’ on public authorities.  
7 Under the ‘biodiversity duty’, public authorities must show regard to the conservation of  
8 biodiversity in exercising their function (NERC Act, 2006). Biodiversity loss is a global  
9 phenomenon, whose impact goes far beyond the local administrative boundaries. Meanwhile,  
10 biodiversity conservation is mainly a local issue and local governments are the guardians of  
11 these natural resources. They manage large public areas of land, much of which contains  
12 important biodiversity values, and are responsible for planning and regulating many activities  
13 which have an impact on biodiversity. The decisions that local councils make in regards to  
14 biodiversity directly affect the well-being of the communities they represent. Local councils  
15 are accountable to such communities. These communities have the right to know about the  
16 status of local biodiversity, the actions undertaken to conserve and protect biodiversity, as  
17 well as the progress achieved. Local councils have the duty to meet these disclosure  
18 expectations (GRI, 2005) and to discharge their accountability to the community.  
19 Consequently, biodiversity reporting is a topic relevant to both academics and policymakers.  
20 By analysing the population of English local councils, this research study aims to achieve two  
21 purposes. First, it explores how biodiversity-related information is disclosed in the public  
22 sector, by developing a comprehensive disclosure index. Greater transparency on local  
23 biodiversity creates more informed societies, increases the understanding of the biodiversity  
24 impact and also transforms attitudes and behaviour in relation to biodiversity (Jones and  
25 Solomon, 2013). Second, this paper investigates which factors are associated with the level of  
26 biodiversity disclosure provided by local councils.

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28 This article makes a number of key contributions to the existing body of knowledge. First, it  
29 adds to the environmental reporting literature by investigating biodiversity reporting, a  
30 neglected area in the public sector accounting literature. Previous studies on environmental  
31 and biodiversity reporting have mainly focused on the private sector (Ball and Grubnic,  
32 2007), whereas the public sector has been less researched (Ball, 2004). With the exemption of  
33 Siddiqui (2013); Raar (2014), Samkin et al. (2014), Schneider et al. (2014), Barut et al.  
34 (2016); Gaia and Jones (2017) and Weir (2018) who studied biodiversity reporting practices  
35 within public sector organisations, previous studies have only analysed biodiversity reporting  
36 in the corporate sector. Second, it empirically investigates the potential determinants of  
37 biodiversity disclosure. With the exceptions of Rimmel and Jonall (2013) and Adler et al  
38 (2018), previous studies on biodiversity reporting have not investigated which factors  
39 influence the extent of biodiversity reporting. This study is, to the best of our knowledge, the  
40 first one to investigate the determinants of biodiversity disclosure in organisations operating  
41 in the public sector. Unlike Rimmel and Jonall (2013) who investigate the reasons behind  
42 biodiversity disclosure on the basis of interviews with corporate representatives, this study  
43 uses multivariate analysis to relate the extent of biodiversity disclosure to the potential  
44 explanatory variables. Third, this study responds to the call for more examination of the  
45 underlying arguments of legitimacy theory in the public sector (Burritt and Welsh, 1997;  
46 Frost and Seamer, 2002), as it relies on a multi-theoretical framework composed of agency,  
47 stakeholder, legitimacy and institutional theories to explain the extent of biodiversity  
48 disclosures among local authorities.

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50 The remainder of this paper has four sections. The second section describes the theoretical  
51 framework and the hypotheses development, while section 3 illustrates the research  
52 methodology. Section 4 presents the empirical results. And finally, the discussion of the  
53 results and the main conclusions are reported in Section 5.  
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## 2. Theoretical Framework and hypotheses development

A unanimously accepted theoretical framework of the underlying determinants of voluntary disclosure still does not exist (Gray et al. 1995, Verrecchia, 2001; Cormier et al., 2005). The only wholly unifying assumption among different theories is that organisations are likely to disclose information that is favourable to them and unlikely to disclose information that is unfavourable to them (Dye, 2001). Several theoretical approaches have been used to explain the voluntary disclosure of both financial and non-financial information, in public and private contexts. In the context of social and environmental disclosure, Gray et al. (1995) identified economically-oriented theories and socially-oriented theories as the most recurrent theoretical approaches adopted.

Economic-oriented theories are mainly based on agency theory, which believes that organisations use social and environmental disclosure to reduce agency costs that could arise in the form of political costs (Belkaoui and Karpik, 1989; Zimmerman, 1977). Agency problems exist whenever there is a delegation of decision-making authority from a principal to an agent (Jensen and Meckling, 1976). Agency problems thus exist in all organisational contexts: in firms between shareholders and managers and in governmental authorities between politicians and citizens (Zimmerman, 1977). Politicians, such as local governments, might use the voluntary disclosure of information to reduce the information asymmetry with the citizens and reduce the extant agency conflict.

Social theories, such as institutional, legitimacy and stakeholder theories are considered those that provide the most comprehensive framework for social and environmental disclosure (Gray et al. 1995; Cornier et al 2005). These three theories are neither separate nor competing but largely overlapping (Deegan and Blomquist 2006; Deegan, 2007). Institutional theory posits that organisations cannot be studied in isolation from the political, social and institutional context within which the organisation operates as they both are influenced by it and influence it (Cornier et al 2005; Deegan, 2002). Organisational practices do not develop in a vacuum, as organisations are embedded in a nexus of formal and informal rules. Social and environmental disclosure is the result of macro social processes (DiMaggio and Powell, 1983). Both stakeholder theory and legitimacy theory share the assumptions of institutional theory that organisational practices (such as social and environmental disclosure) are influenced by the values of the context in which the organisation operates. They provide consistent but slightly different explanations for social and environmental disclosure (Deegan, 2007).

Legitimacy theory argues that organisations must act within the boundaries of the societies in which they operate consider acceptable (Dowling and Pfeffer, 1975). The greater the likelihood of negative social perceptions of organisational activities, the greater the organisations' desire to gain or maintain legitimacy. Organisations seeking legitimacy try to ensure that they operate within the norms of their societies and will adopt strategies and practices that are congruent with social values, expectations and norms (Meyer and Rowan, 1977). The need for legitimacy is usually associated with highly contested topics such as social and environmental issues (Deegan and Gordon, 1996; Guthrie and Parker, 1989; Patten, 1991). Legitimacy theory considers the disclosure of voluntary information as a means by which organisations that want to gain or maintain legitimacy can potentially influence external perceptions of the organisation and public opinion (Deegan, 2007; Dowling and Pfeffer, 1975).

Stakeholder theory suggests that social and environmental disclosure is used as a mechanism to show the accountability of an organisation toward its stakeholders (Deegan, 2002; Gray et al., 1996). The accountability duties of local governments toward their stakeholders exceed those in the business sector. Local government officials act as agents of the citizens that elected them. They must be accountable to the society for the authority they exercise (Barton,

2005). The disclosure of information about how the local area is managed represents a means to manifest their accountability to the stakeholders. Stakeholder theory expands legitimacy theory as it helps to identify which stakeholder group expectations the organisation should take into accounts in order to comply with its social contract (Gray et al., 1996). Because of the many similarities between institutional, legitimacy and stakeholder theories any attempt to treat them as separate theories would be wrong (Deegan, 2007; Gray et al., 1995).

Cormier et al. (2005) noted that the empirical findings on the determinants of social and environmental reporting (see Jones et al. 1995 for a review) raise the concern that any single theory is not capable of adequately explaining social and environmental disclosures. If the research questions are conjectured from only one theoretical perspective, the richness of understandings which can be obtained from combining different theoretical perspectives is lacking. A wider theoretical framework that combines different theoretical perspectives might enhance our understanding of social and environmental disclosures (Cormier et al., 2005; Gray et al., 1995). For these reasons, we have adopted a multi-theoretical framework that relies on economic and social theories, respectively agency theory and stakeholder, legitimacy and institutional theories, to explain the extent of biodiversity disclosures among local authorities. However, it has been argued the use of a theoretical framework based on different perspectives might challenge conceptual clarity and create difficulties in integrating the various perspectives into a coherent theoretical framework (Bello and Kostova, 2012). Therefore, to address this issue, we followed Bello and Kostova (2012) and limited our study's theoretical perspectives to the most essential ones in light of our research questions. We also paid attention to the interactive effects and complementary of the different theories used. We focused on agency, legitimacy, stakeholder, and institutional theories because they are the most recurrent theoretical approaches adopted to study environmental disclosures (see Cormier et al., 2005; Gray, 1995) and because legitimacy, stakeholder, and institutional theories are complementary in nature (Deegan, 2007; Gray et al., 1995).

### *2.1. Voluntary disclosure and the demand of information*

Local councils are organisations governed by politicians. The relationship between local councils' politicians and citizens can be described as an agency relationship whereby the citizens are the principals and the politicians are the agents (Zimmerman 1977). One of the primary functions of accounting is the production of information for external users who have no access to the information. The disclosure of such information is considered as an instrument to reduce the information asymmetry between agents and principals and mitigate the associated agency conflicts (Healy and Palepu, 2001). An increase in the population of a local council increases information asymmetry, as there are more citizens not directly involved in the administration of the local area. The demand and, therefore, the disclosure of information will be higher in local councils with a higher population (Zimmerman 1977). The activities undertaken by local councils on the management of local biodiversity affect several areas of the local community and have an impact on the well-being of the council's population. This population has the right be informed about the state of local biodiversity even when there is no legal obligation for the local government to do so (Schneider et al., 2014). Highly populated local councils might thus be subject to greater pressures from their citizens to provide information about the strategies adopted to preserve local biodiversity. Moreover, previous studies indicate that the availability of financial and managerial resources is pivotal to support planning in the public sector (Berke et al, 1996). In contrast with more traditional public functions, environmental conservation policies suffer from a lack of financial and managerial resources, as they are less established and their importance is less generally accepted (Ring, 2002). In most countries, financial resources are allocated to local councils on the bases of the number of inhabitants and using weighting factors that increase

with the population size. The more inhabitants a local councils has, the higher the amount of financial resources that are transferred to it (DCLG, 2013). Highly populated local councils tend also to have higher tax base and rates and, thus, the availability of more financial resources (Damanpour and Schneider, 2006). Previous studies noted that smaller local councils are more likely to lack staff capacity and thus do not have the ability to implement more advanced administrative initiatives (Berke et al. 1999). Meanwhile, highly populated local councils have a better ability to attract newcomers by maintaining low taxes through adopting cost saving programmes and attracting more professional staff (Damanpour and Schneider, 2006). For these reasons, it can also be argued that highly populated local councils have greater ability to obtain more financial and managerial resources which might lead them to adopt and implement more environmental conservation initiatives, such as biodiversity conservation, and disclose related information. Thus, we expect the following hypothesis:

*H1: There is a positive relationship between the size of the population served by local councils and the level of disclosure of biodiversity information*

### *2.2. Voluntary disclosure and political competitions*

The main premise of agency theory in the political context is that the interest of voters and politicians are not perfectly aligned, so that the latter might have the incentive to put in place actions that the former might dislike (Ferejohn, 1999). In public sector organisations, elections represent the main political accountability mechanisms. In line with the assumption of agency theory, disclosure can be used by local councils' governing groups as a matter of communication to show that they are honouring the promises made to their voters during the electoral campaigns, as their re-election depends on elector's satisfaction (Giroux, 1999). The pressure to meet electors' demands for local councils' politicians is higher when their political opposition is powerful (Downs, 1957). Stronger political oppositions are likely to monitor closely the governing group and inform the public opinion of any deviation from their electoral promises, in order to reduce the governing group's electoral support in the following elections (Baber and Sen, 1984). In this situation the political party in power is subject to higher external pressures to disclose more information to the general public (Laswad et al., 2005). In this way they can demonstrate to their electors that they are adopting effective policies and are maintaining the promises made to them during the electoral campaign. Hence, we expect that:

*H2: There is a positive relationship between the level of political competition within the local councils and the level of disclosure of biodiversity information.*

### *2.3. Voluntary disclosure and political ideology*

Politicians base their political actions and election programs on an ideology. Different parties have different political agendas which are based on the party's ideology. For politicians it is important to be considered legitimate and credible, especially among their voters (Tagesson et al., 2013) as they need their support for re-election. The voting preferences of citizens are indicative of the issues on which they hold the local councils to account. The greater the presence in the local council of councillors elected from parties whose political manifesto gives prominence to environmental values, the greater the importance of environmental values for the citizens the local council represents. Local councils composed of councillors from environmentally-oriented political parties are thus likely to develop policies that place more importance on environmental issues, as this will help them to get support from their voters. Politicians increase the level of disclosure in order to obtain voters' trust (Ferejohn, 1999). In line with the assumptions of institutional and legitimacy theories, they might

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3 develop disclosure strategies in line with the environmental values of the context they are  
4 managing to show conformity with the values of the citizens that voted them, and they  
5 represent and maintain and improve their legitimacy with their voters. Local councils with a  
6 higher proportion of councillors elected from environmentally-oriented political parties will  
7 be keener to implement higher levels of transparency on biodiversity-related information.  
8 This will show to the community they represent that they share the same environmental  
9 values as them. Thus, we expect that:  
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12 *H3: There is a positive relationship between the presence in the local councils of councillors*  
13 *from environmentally-oriented political parties and the level of disclosure of biodiversity*  
14 *information.*  
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#### 17 2.4. Voluntary disclosure and environmental NGOs

18 Stakeholder theory suggests that stakeholders' monitoring organisations activities increases  
19 the likelihood that organisations disclose more information (Roberts, 1992). The disclosure of  
20 voluntary information represents a tool that organisations can use to discharge their  
21 accountability toward their stakeholders (Gray et al., 1996). Among the various organisations  
22 stakeholders, NGOs are one of the most powerful stakeholders who are concerned about the  
23 information that organisations disclose to the general public (Kim and Lyon, 2011). NGOs  
24 are non-profit organisations working for common welfare representing the views of groups of  
25 citizens with similar interests on specific issues (such as the environment). Their primary  
26 objective is to influence the policies adopted by public authorities and businesses (O'Dwyer  
27 et al. 2005). They have been found to impact organisations' social and environmental  
28 behaviour and influence them to disclose more information (Campbell, 2007; Deegan and  
29 Blomquist, 2006; Doh and Guay, 2006; O'Dwyer et al. 2005). At a policy level, several  
30 studies have provided empirical evidence that policymakers are receptive to demands from  
31 environmental groups (Cress and Snow, 2000). Biodiversity conservation has become  
32 nowadays increasingly important for Environmental NGOs, with most of them undertaking  
33 initiatives aimed at conserving wild and domesticated fauna and flora. When such  
34 organisations are present in the local councils' area, local councils might be more active on  
35 biodiversity conservation and communicate more biodiversity-related information. We thus  
36 expect the following hypothesis:  
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41 *H4: There is a positive relationship between the presence of environmental NGOs in the area*  
42 *managed by the local councils and the level of biodiversity disclosure.*  
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#### 45 2.5. Voluntary disclosure and poor biodiversity management

46 Voluntary disclosure can be provided by organisations to achieve legitimacy (Dowling and  
47 Pfeffer, 1975). Organisations seeking legitimacy try to ensure that they operate within the  
48 norms of their respective societies by adopting strategies and practices that conform to  
49 societal norms, values, and expectations (Meyer and Rowan, 1977). An organisation's  
50 legitimacy is threatened when the organisation is a poor environmental performer. Such  
51 organisations face more social pressures and might use environmental disclosure in order to  
52 restore their legitimacy and reduce the social concerns about their environmental  
53 performance (Clarkson et al, 2008). Local councils who manage areas that suffer from  
54 biodiversity deterioration are subjected to a greater external criticism on their sustainable  
55 management strategies. They might, therefore, voluntarily choose to disclose biodiversity-  
56 related information in order to reduce such criticism and restore their legitimacy within the  
57 society in which they operate. Thus, we expect that:  
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3 *H5: There is a positive relationship between local councils' poor biodiversity management*  
4 *and the level of disclosure of biodiversity information.*  
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#### 7 2.6. Voluntary disclosure and local council's visibility

8 A visible organisation attracts a disproportionate share of scrutiny by politicians, organised  
9 groups and the general public. This makes the organisation a potential for political action  
10 since they attract more attention from stakeholders than less visible organisations (Lim and  
11 McKinnon, 1993; Powell 1991). Legitimacy theory suggests that public visibility provides a  
12 strong incentive for organisations to provide voluntary information (Frost and Semaer, 2002;  
13 Patten, 1991). Visible organisations are more affected by social constraints and pressures than  
14 non-visible organisations (Belkaoui and Karpik 1989). They are also subjected to greater  
15 scrutiny from interested stakeholders and are usually under higher media coverage than less  
16 visible organisations (Neu et al, 1998). In such cases, more pressure is put on them to  
17 disclose information (Patten, 1991). Social and environmental disclosure can be used by  
18 visible organisations to respond to such pressure (Guthrie and Parker, 1989) and as a  
19 proactive method to influence the society in which they operate (Roberts, 1992). It is thus  
20 reasonable to assume that local councils with a higher visibility disclose more biodiversity-  
21 related information as they are subject to a greater pressure to maintain or increase their  
22 legitimacy. Hence, we expect that:  
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26 *H6: There is a positive relationship between the visibility of local councils and the level of*  
27 *disclosure of biodiversity information.*  
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#### 30 2.7. Summary

31 Our set of hypotheses has been developed starting from the assumptions of agency and  
32 stakeholder theories which have been then complemented by institutional and legitimacy  
33 theories. Politicians are linked to the citizens they represent and the other stakeholders  
34 because of an agency stakeholder relationship where politicians act as the agents of the  
35 citizens and the other stakeholders. The wealth of citizens and stakeholders is affected by the  
36 actions that politicians undertake. Politicians could be self-interested and develop political  
37 strategies and actions aimed at pursuing their personal interests rather than the interests of the  
38 citizens or the other stakeholders (Zimmerman, 1977). The disclosure of public information  
39 can be thus used by politicians to manage their relationships with their citizens and the other  
40 stakeholders to show them that the political actions adopted are in line with their interests. In  
41 line with agency and stakeholder theories, the incentive for politicians to disclose information  
42 increases when the demand for disclosure is higher. This is because of the presence of more  
43 citizens or more interested stakeholders on biodiversity, or when politicians are pressured  
44 from strong political oppositions to please their voters to maintain their political support. The  
45 incentives of politicians to provide citizens and other stakeholders with relevant information  
46 might stem from the monitoring role played by these actors. However, these incentives might  
47 also result from the importance for politicians to show that they consider the local  
48 institutional context and the values of the citizens and stakeholders they represent, and to  
49 maintain legitimacy among these citizens and stakeholders. Thus, in line with institutional  
50 theory the incentive to disclose biodiversity information becomes more prominent in  
51 communities that give more importance to environmental values, as politicians have the need  
52 to show conformity with the value of the community they represent. While, in line with  
53 legitimacy theory, this incentive becomes more prominent in more visible councils or in  
54 councils that do not perform well from a biodiversity perspective, as in such cases there is a  
55 greater public scrutiny, a major threat to these councils' legitimacy.  
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### 3. Research Methodology

#### 3.1. Sample and data gathering

To analyse biodiversity reporting in the public sector and investigate the potential determinants of biodiversity disclosure we analysed the disclosure practices adopted by the entire population of 353 English local councils.<sup>1</sup>

We investigated biodiversity disclosure by analysing the information disclosed by local councils in the biodiversity and/or natural environment conservation pages available in their official websites and in the biodiversity reports, biodiversity strategic documents and biodiversity action plans published in their website. We chose to analyse disclosure on websites as the internet provides more possibilities for organisations to increase their accountability toward their stakeholders, as it gives stakeholders access to information quickly and easily (Armstrong, 2011). Moreover, this also answers the call of Lodhia et al. (2004) for more studies on social and environmental disclosure on internet to complement the research into conventional annual reports.

To investigate the determinants of the extent of biodiversity disclosure we collected data from different sources. Local councils' population and area size were gathered from the Office for National Statistics (ONS) databases which is the UK's largest independent producer of official statistics. Data about the size and conditions of local protected areas was gathered from Natural England, an executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs. Information about local environmental NGOs was gathered from Charity Choice, the UK's largest charity directory. Local councillors' political composition was obtained from the [www.gwydir.demon.co.uk](http://www.gwydir.demon.co.uk) website, while local councils' financial data was sourced from the Government National Statistics available at <https://www.gov.uk/government/statistics>.

Because of missing data for two local councils, our final sample is composed of 351 local councils.

#### 3.2. Institutional setting

##### 3.2.1. Local councils in England

Local governments in England work within the powers laid down under various Acts of Parliament. Most of the services provided by local councils are based on mandatory requirements. Some of these services are tightly controlled by the central government, resulting in a similar level of service across the country. In other cases, local councils have some choice over the level and type of service they provide. Since the Local Government Act 2000, local councils have responsibility for the economic, social and environmental wellbeing of their area.

The structure of English local councils varies from area to area. They can operate under either a two-tier or a one-tier structure. In most of England, local councils have a two-tier structure, with responsibility for council services split between the two tiers: county and district. County councils cover the entire county area and provide most of the services in such areas (like education, fire and public safety, libraries, planning, social care, trading standards, transport and waste management). Each district council covers a smaller area and provides mainly local services (like council tax collections, housing, planning applications, recycling and rubbish collection). Local councils that operate under a one-tier structure are less diffused. They can be of three main types: unitary authorities, London boroughs and metropolitan districts. One-tier local councils usually provide all the local services listed above, except in London and in metropolitan areas where some services, like fire, police and

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<sup>1</sup> There are 353 local councils in England divided in 27 county councils, 201 district councils, 32 London boroughs, 36 metropolitan districts, 55 unitary authorities and two sui generis unitary authorities.

public transport, are provided through ‘joint authorities’. Local councils are made up of democratically elected councillors who together represent the community in their jurisdiction. All councillors are members of the full council which sets the council’s vision and direction. Local councils are run on a system similar to that of central government, with a small number of councillors that form a cabinet, or executive board, in charge of the decision-making process and the other councillors being active in performing overseeing and monitoring activities.

Local councils are funded by grants received from central government, council tax and business rates. Central government provides grants to enable local authorities to deliver all the mandatory services. The amount of the grant a local council receives is based on the number and value of properties in the area and on the cost to provide services there. The council tax provides about a quarter of local funding. The level of the council tax is set on the base of the overall budget for the year. Local councils also obtain income from investments, council rents, sales and/or charges for discretionary services.

### 3.2.2. *The local government biodiversity duty*

In England, local councils have a responsibility to protect preserve and enhance biodiversity under the Natural Environment and Rural Communities Act (NERC) 2006 and the National Planning Policy Framework (NPPF) 2012. Section 40 of the Natural Environment and Rural Communities Act (NERC) 2006 places a ‘duty’ on all public authorities to have regard to the conservation of biodiversity in exercising their functions. This ‘duty’ affects all public authorities in England, which include public bodies, local government and statutory undertakers. The key purpose of this duty is to raise the profile and visibility of biodiversity, clarify existing commitments with regard to biodiversity, and to make consideration of biodiversity an integral part of policy and decision making throughout the public sector (DEFRA, 2007). Implementing the ‘biodiversity duty’ requires local councils to ensure that biodiversity is protected and enhanced. This is done by contributing to the achievement of the aims of Biodiversity Action Plans, key biodiversity indicators and targets and also by incorporating biodiversity considerations into all the decisions related to relevant service areas and functions. In particular, local councils need to take biodiversity considerations into account in the development and delivery of key policies/strategies, planning systems and licensing schemes that have an impact on land use and the environment. They also have to consider the impact that the development of new infrastructures and the management of lands and buildings that impact wildlife sites will have on biodiversity. Moreover, the biodiversity duty requires that local councils develop awareness raising activities aimed at influencing the attitudes of people, businesses and land managers toward biodiversity conservation (DEFRA, 2007).

The National Planning Policy Framework (NPPF) sets out planning policies which local planning authorities should have regard to on biodiversity matters. It states that the planning system should contribute not only to conserving existing biodiversity but also to enhancing or restoring, where possible, the habitats rich in biodiversity. In this way, local councils can make a significant contribution to the achievement of the commitments made by the UK Government. In the UK, biodiversity policy is a devolved responsibility: England, Scotland, Wales and Northern Ireland have developed their own biodiversity or environment strategies. The Biodiversity strategy for England was published in 2011 with the mission “to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people” (DEFRA, 2011, p. 4). According to this strategic document, the mission will be achieved by: a) adopting a more integrated large-scale approach to conservation; b) engaging more people in biodiversity issues so that they are aware of the importance of biodiversity

and what they can do to help; c) reducing environmental pressure by ensuring that biodiversity considerations are taken into account by decision-makers within sectors which directly influence biodiversity and d) improving the knowledge on the current status and trends in biodiversity (DEFRA, 2011, p. 5).

Local action for biodiversity is considered to be essential to achieve the strategy's objectives. In particular, the strategic document encourages local councils to use local planning to support the creation of nature improvement areas, by identifying them in their local plans, to take a more active and positive role in the management of local sites, and to report data about the state of these sites (DEFRA, 2011, pp. 19-20).

No specific legal obligation to report biodiversity-related information exists for English local authorities. However, according to the Environmental Information Regulations (EIR) 2004, which administers access to environmental information held by public authorities, local authorities should make environmental information available proactively, using easily accessible electronic means whenever possible. This means that councils should make the information available online. The state of biodiversity and its components is considered as environmental information according to the European Directive 2003/4/EC. The minimum information to be routinely published includes policies, plans and procedures relating to the environment, reports on the state of the environment, and environmental impact studies. It also includes data taken from monitoring activities and risk assessments that affect or are likely to affect the environment. Thus, there is a general obligation for local authorities to publish information on the local biodiversity, although no specific requirements exist on the content of such information, the format or the period in which this information should be released.

### 3.2.3. Biodiversity status in England

The loss of biodiversity is widespread at national and international level - with a number of different species becoming extinct in England in recent years. To halt biodiversity loss, the Biodiversity strategy for England has been set together with a set of biodiversity indicators that track the progress of the achievement of the strategy objectives. These biodiversity indicators comprise 24 indicators and 51 measures which are assessed both in the long-term and in the short-term<sup>2</sup>. Since 2012, when these indicators were developed, the Department for Environment, Food and Rural Affairs has published an annual report where biodiversity indicators are updated with the most recent data. The report published in December 2015 (DEFRA, 2015) shows a general improvement of biodiversity indicators and measures, in both the long term and the short term. In particular, this relates to the objective of improving the knowledge on the current status and trends in biodiversity. The indicators show an increase in the number of records added every year to the Biodiversity Network Gateway and in the number of publicly accessed records (DEFRA, 2015, p. 191).

The increase in the availability of this information is very important as it allows a more widespread understanding about the distribution of habitats and species which can help decision makers to take more informed decisions on how to protect English wildlife. Important achievements have also been recorded in relation to the objective of reducing environmental pressure. The DEFRA report shows that the percentage of sensitive habitat affected by air pollution is decreasing, as well as the presence of harmful substances in the marine environment, while the hectares of lands targeted by environmental management scheme agreements are increasing ((DEFRA, 2015, p. 157-190). In relation to the objective of engaging more people in biodiversity issues, the DEFRA report (DEFRA, 2015, pp. 136-

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<sup>2</sup> Please see the DEFRA website at <https://www.gov.uk/government/statistics/england-biodiversity-indicators> for more information about these indicators and measures.

156) shows that in 2015 26% of English people engaged with biodiversity conservation activities. It also shows that people are spending more time in volunteering activities aimed at improving environmental conditions in comparison to the start of the millennium. However, less time was spent in comparison to the previous five years.

The report also shows that the financial resources devolved to biodiversity conservation have significantly increased from the beginning of the millennium, reaching a peak of £ 450 million in 2009, right before the year of Biodiversity. However, since then there has been a steady decrease in the public spending which in 2015 stopped at nearly £ 350 million. This is not promising, as without adequate financial support biodiversity conservation actions cannot be pursued. Some important improvements have been achieved in relation to the objective of adopting a more integrated large-scale approach to conservation, although some areas of concerns still exist in this area.

The report shows a drastic reduction in the abundance and diversity of species in the wider countryside, a higher concentration of pollinators in specific areas which might negatively affect their ability to contribute to ecosystem services. However, on the other hand, the extent and condition of protected areas and local sites has been improved. This is especially true in relation to the acres of protected sea areas and the percentage areas of Sites of Special Scientific Interest (SSSI) in favourable or recovering conditions. The percentage area of SSSIs in favourable or recovering conditions has increased substantially from 65% in 2003 to 95% since 2011. There are now 4,000 SSSIs in England, covering about 7% of its area and evenly distributed across the country. Figure 1 shows a map of England that classifies its local councils in accordance with the status of the SSSIs located in the local councils' area.

#### INSERT FIGURE 1

The map shows that in 2015 the majority of English councils have SSSIs with a percentage area in favourable or recovering conditions equal or greater than 95%. However, very few councils have SSSIs with a percentage area in favourable or recovering conditions equal to 100%. The map also shows that several councils administrate areas where SSSI conservation status is below the national average of 95%. A relevant number of them (44 local councils), particularly those located in the central and west parts of England, are facing major conservation issues, as the percentage area of SSSIs in positive condition is lower than 85%.

### 3.3. Biodiversity Disclosure Index

Disclosure has been defined as an abstract concept that cannot be measured directly (Marston and Shivres, 1991). Despite this the extent of voluntary disclosure has been extensively investigated by using indirect, although subjective measures. Content analysis has been extensively used as an empirical research tool to measure disclosure in the field of financial reporting (e.g. Patelli and Prencipe, 2007; Raffounier, 1995), and social and environmental reporting (e.g., Gray et al., 1995; Guthrie and Abseysekera, 2006; Guthrie & Parker, 1990; Patten, 2002). Content analysis involves "codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity" (Abbott and Monsen, 1979, p. 504). Various methods of content analysis can be used in order to evaluate disclosure. They range from the counting of words, sentences or paragraphs to the use of disclosure indexes that assess whether a specific item is disclosed. Disclosure indices are considered to be a valid research tool to assess the comprehensiveness of disclosure (Hooks & Van Staden, 2011) and have been used extensively in the accounting literature (e.g., Adler et al. 2018; Botosan, 1997; Cornier et al. 2005; Raffounier, 1995; Patelli and Prencipe, 2007). A disclosure index is usually constructed as a function of the number of the items provided in the annual reports (Botosan, 1997).

This study uses a self-constructed disclosure index in order to evaluate the disclosure of biodiversity-related information by local authorities. Following previous studies (e.g., Patelli and Prencipe, 2007; Raffounier, 1995), to limit subjectivity, the selection of the items to be included in the index was based on the Guidance on Biodiversity published by UK Biodiversity Organisations (UKBG, 1995; UK LIAG, 1997; DEFRA, 2007). This provides local councils with recommendations on the biodiversity-related information to disclose. In selecting the items of the biodiversity disclosure index we also considered previous studies on biodiversity reporting (Atkins et al., 2014; Samkin et al., 2014; Shneider et al., 2014)

The primary sources of information used in this research were local authorities' websites. As noted by Laswad et al. (2005) websites are one of the most effective tools to disclose information to the public. Moreover, websites are not only sources of information in their own right but also give access to formal accountability documents, such as biodiversity reports, biodiversity strategies, biodiversity action plans and other biodiversity-related publications (Schneider et al., 2014).

To ensure that all the information on biodiversity was captured, the following terms "biodiversity", "biological diversity", "natural environment", "wildlife", "habitat", "species", "habitat" "flora," "fauna", "environmental protection" and "environmental conservation" were used as keywords to search the local councils' website. The keyword search was performed between December 2015 and February 2016. All the webpages and documents found were then further searched for the 31 items included in our Biodiversity Disclosure Index (BDI) (see table 2 for the list of items included in the BDI), divided into the following broad categories: a) Scene setting (7 items); b) Strategic planning (6 items); c) Implementation (10 items); and d) Evaluation (8 items).

A coding scheme was prepared to identify the classification criteria for each of the 31 items. Examples of narratives to be coded in each category-item were prepared and discussed before starting the analysis (Bozzolan et al., 2003). To test for the clarity and consistency of our categories and validate the coding scheme, the internet disclosure provided by five local councils were analysed and independently coded by two researchers. The results of the individual classifications were then compared and misalignments identified. Any discrepancy was re-analysed and resolved by discussion between the two researchers (e.g., Lee, 1999). Following this procedure, a final set of coding rules was defined. Subsequently, the internet disclosure of a further five local councils was analysed independently by two researchers. No further discrepancies emerged, it was thus deemed appropriate to have the disclosure of the remaining local councils analysed and coded by one researcher.

The items were scored using a binary coding system. We gave a score of 1 if there was information about the item and a score of 0 if there was no information. For each local council we computed a biodiversity disclosure index (BDI), calculated as the percentage ratio of the sum of the actual score awarded to the local council for each item of disclosure divided by the maximum possible potential score (Patelli and Prencipe, 2007; Raffounier, 1995). The proportional score approach, allows comparable disclosure scores to be constructed for each local council.

### 3.4. Multivariate analysis

To investigate the potential factors that provide an incentive to the local councils to disclose biodiversity-related information we used the following OLS regression model:

$$BDI_i = \alpha_0 + \beta_1 Population_i + \beta_2 Political\ competition_i + \beta_3 Environmental\ ideology_i + \beta_4 Environmental\ NGOs_i + \beta_5 Poor\ biodiveristy\ management_i + \beta_6 Visibility_i + \gamma Control\ variables_i + \varepsilon_i$$

where  $i$  is the local council,  $\beta$  are the coefficients that measure the sensitivity of the Biodiversity Disclosure index (BDI) to the independent variables and  $\gamma$  is the coefficient that measures the sensitivity of the Biodiversity Disclosure index (BDI) to the control variables.

The dependent variable is the Biodiversity Disclosure Index (BDI) which is calculated as percentage ratio of the sum of the actual score awarded to the local authority for each item of disclosure divided by the maximum possible potential score. It takes values from 0 (no disclosure) to 100 (full disclosure).

The independent variables used to test our hypotheses were designed as follows:

- *Population*. This was measured as the natural logarithm of the number of inhabitants of the local council area.

- *Political competition*. This was measured as the percentage difference in the number of councillors elected from the winning party and the number of councillors elected from runner-up parties divided by the number of available positions in the council. Low scores are indicative of high political competition, while higher scores indicate low political competition.

- *Political ideology*. In England, the promotion of pro-environmental policies is at the core of the political vision of the Liberal Democrats and the Green Party. In comparison with the other English political parties, Liberal Democrats and the Green party have consistently given more prominence to the environment in their manifestos for a long time (Carter, 2013). Thus we estimated local councils' political ideology as the percentage ratio between the local councillors appointed from either the Green party or the Liberal Democratic and the total number of councillors.

- *Environmental NGOs*. This was measured as the number of environmental NGOs registered in the local council area scaled by the area size of the local council.

- *Poor biodiversity management*. In England, natural protected areas are designed as Sites of Special Scientific Interest (SSSI). All SSSIs are divided into units and the conservation conditions of each unit is assessed separately and classified into one of the following six categories (Natural England, 2015): 1) *Favourable*, when the SSSI unit is being adequately conserved and is meeting its 'objectives'; 2) *Recovering*, when the SSSI unit is not fully conserved but all the necessary management measures are in place and it is expected that the unit will reach favourable condition in time; 3) *Unfavourable no change*, when the unit is not being conserved and will not reach a favourable condition unless there are changes to the site management or external pressures. 4) *Unfavourable declining*, when the unit is not being conserved and its conditions are becoming progressively worse; it will not reach a favourable condition unless there are changes to site management or external pressures; 5) *Partially destroyed*, when lasting damage has occurred to part of the SSSI unit, such that it has been irretrievably lost and will never recover. 6) *Destroyed*, when lasting damage has occurred to the entire unit, such that it has been irretrievably lost. The last two categories are indicative of extremely poor biodiversity management, with no or inadequate conservation practices in place, which has led to permanent biodiversity losses with no possibility for the units to recover (Natural England, 2015). We thus measured poor biodiversity management as the percentage ratio of the hectares of the SSSIs classified as partially destroyed or destroyed over the total hectares of the SSSIs managed by the local council.

- *Visibility*. Local councils that operate in the London region are likely to enjoy greater visibility than those operating in the other English regions. London, the capital of England, is one of the world's leading financial centres and an area in the world with one of the highest Gross Domestic Product (GDP) (OECD, 2006). It is thus more likely that local councils in London are subject to a greater public exposure and media coverage than those of the other

English regions. Visibility was thus estimated as a dichotomous variable which equals 1 if the local councils operate in the London area, and 0 otherwise.

The following control variables were considered:

- *Local council area*. Larger areas are likely to incorporate greater biodiversity. Greater biodiversity could require local councils to adopt more actions to protect and conserve local biodiversity. This might, in turn, favour an increase in the disclosure of biodiversity information. It was measured as the natural logarithm of the area, measured in hectares, administrated by the local council.

- *SSSI*. Local councils that manage larger areas which receive protection because of their recognised natural and ecological values might disclose more biodiversity information. They are more likely to have in place more policies aimed at conserving local biodiversity. This was measured as the percentage ratio of the hectares of the SSSIs present in the local council compared to the total hectares of the area administrated by the local council.

- *Per capita income*. Previous studies have found that government entities with a higher income per resident are likely to disclose more information (Ingram, 1984; Piotrowski and Van Ryzin, 2007). It has been measured as the natural logarithm of the average income of the residents living in the local council area.

- *Council type*. English local councils can operate under either a one-tier structure or a two-tier structure. While one-tier councils provide all the local services in the local area, in two-tier councils the provision of local services is shared between two councils: county and district. As two-tier councils share the provision of local services, it might be possible that they also share the disclosure of information. Consequently, one-tier counties/districts might disclose less biodiversity information because the same information is disclosed at a district/county level. To control for this potential effect, we used a dichotomous variable which equals 1 if the local council has a two-tier structure and 0 otherwise.

## 4. Results

### 4.1. Descriptive statistics of local councils' characteristics

Table 1 summarises the main characteristics of the local councils analysed.

On average the local councils analysed administrate an area of 62,276 hectares and serve a population of 211,641 inhabitants. Local councils' residents have an average income of nearly £ 30,000. Less than 10% of the local councils analysed operate within the London area and most of them have a two-tier structure (65%). SSSIs represent on average 2.4% of the area managed by the local councils, with an average of 0.14% of these SSSIs being classified as partially destroyed or destroyed. The political ideology of the councils analysed is not very prominent, with Greens and Liberal Democrats representing on average nearly 13% of the local councils' councillors. Political competition is on average not very high, with the percentage difference in the number of councillors elected from the winning party and the runner-up parties being on average 40%. On average, in the local councils analysed there is one local Environmental NGOs for every 10,000 hectares.

INSERT TABLE 1

### 4.2. Findings on biodiversity disclosure

Our findings show that as many as 179 out 351 English local councils do not report information on local biodiversity.<sup>3</sup> They also reveal that the average level of biodiversity

<sup>3</sup> The timeliness of the information provided by local councils is a very important issue in evaluating the level of biodiversity disclosure. However, the dates of publication of the biodiversity information were not readily available on most of the websites analysed. This was different from biodiversity reports or biodiversity action plans. To make sure that our disclosure index picked up up-to-date information in relation to those items where



disclosure is quite low. Indeed, as shown in table 1, the Biodiversity Disclosure Index has an average level of 15.87% and ranges from a minimum of 0 to a maximum of 93.55%. Table 2 reports the level of disclosure provide by English local councils detailed for the 31 items of the Biodiversity Disclosure Index, grouped into four main categories according to their nature.

#### INSERT TABLE 2

Biodiversity scene setting is the category of biodiversity-related information that is disclosed the most by English local councils. Within this category, the definition of biodiversity is the item that disclosed the most (42% of English local councils), followed by the acknowledgement of the broader problems of biodiversity loss (37%) the categorisation of the local council area by type of habitat (37%) and the regulatory framework for the biodiversity action (33%). By contrast, the main factors that threated local biodiversity are disclosed less (21%). Urban development, intensive farming, pollution, invasive species and inappropriate management of wetland areas are among the most disclosed biodiversity threats. For instance the North East Derbyshire District Council (2016) stated in its website that: “key wildlife habitats have been lost for a number of reasons including intensive farming, road and housing development and through the introduction of foreign species, which has had a devastating effect on many native species”.

Less than one third of the local councils analysed (33%) provided information on the local sites of natural interest existent in their areas. Local councils that disclose this information usually provide information on sites of regional importance such as the Site of Importance for Nature Conservation (SINC) and/or on sites of national importance such the Site of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR). A map showing the locations of such sites is however less frequently reported (24%). The Bracknell Forest Council is an example of one local council that provided detailed information on these sites and shows the location of these sites in the council area (see figure 2).

#### INSERT FIGURES 2

Biodiversity strategic planning was disclosed by less than 20% of the local councils (see table 2). Sixty local councils (17%) explained the vision of the strategy to conserve biodiversity, while the main objectives of these strategies and the time period during which such objectives should be achieved were disclosed in 56 (16%) and 54 (15%) cases respectively. For example, the Oxford City Council (2015, p. 15) stated that the vision of its biodiversity conservation strategy is: “to ensure that Oxford City Council enables a future, rich in wildlife, where people can enjoy climate resilient, healthy and species rich ecosystems which contribute to the conservation of biodiversity in all its forms”. Biodiversity strategies contain in most of the cases general objectives aimed to: ‘conserve and enhance the variety of wild species and natural habitats’, ‘to collect data and map local biodiversity’ and ‘to increase public awareness of, and involvement in, conserving biodiversity’.

How the local councils planned to achieve these objectives was disclosed less frequently (only by 31 out 351 local councils). An example of this type of disclosure has been found in the Biodiversity Action Plan of Chichester District Council (CDC). One main objective of

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timeliness is important (e.g. items related to sections B. Strategic planning, C. Implementation and D. Evaluation), we have considered only information referred to a current period of time at the time when the data collection was performed. Only when timeliness of information was not relevant (e.g. for information related section A. on biodiversity scene setting) we considered also sources of information where the date when the information was published was not available.

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2  
3 this action plan is the creation of an accurate picture of local biodiversity with the outcome of  
4 establishing and maintaining “a comprehensive record of the presence and location of  
5 important habitats and species within the District” (Chichester District Council, 2015, p. 1).  
6 The council stated that it aimed to pursue this objective by undertaking the following actions:  
7 “continue to support the Sussex Biodiversity Record Centre (SBRC) in its role as a repository  
8 for all species and habitat data in the District through our Service Level Agreement; ...  
9 support the transition of Chichester’s Ecological Network Maps on to CDC’s General  
10 Mapping System so that they can be used throughout the organisation” (Chichester District  
11 Council, 2015, p. 1). Specific strategies aimed at conserving endangered local habitats and  
12 species were rarely published, only 43 (12%) and 30 (9%) local councils provided this  
13 information, respectively.  
14

15  
16 Implementation was generally less frequently disclosed than both scene-setting and strategic  
17 planning. Sixty-one local councils (17%) disclosed the name of the local partners (such as  
18 local authorities, statutory and voluntary agencies or NGOs) involved in protecting local  
19 biodiversity and of these, only 48 (14%) described the contribution made by these partners to  
20 the achievement of the main objectives of the biodiversity strategy.  
21

22 The criteria used to identify local priority habitats and priority species were disclosed by very  
23 few local councils (around 12%). For example, Harrow Borough Council listed the following  
24 criteria for selecting priority species: “All London priority species, especially if there is much  
25 potential locally to contribute towards national species targets; Species virtually unique to the  
26 borough or London with a significant proportion of the national population and Species  
27 declining, assessed where possible over the last 25 years” (Harrow Borough Council, 2015, p.  
28 26).  
29

30 There was very little disclosure (less than 7%) of the proposals and actions already  
31 undertaken to conserve priority habitat and species. Examples of these sporadic disclosures  
32 include those provided by the Central Bedfordshire Council, which, in relation to the  
33 protection of orchard habitats stated that: “The People’s Trust for Endangered Species  
34 (PTES) is undertaking a Traditional Orchard Survey to understand where traditional orchards  
35 remain and what condition they are in in order to better protect them” (Central Bedfordshire  
36 Council, 2015, p. 45). Disclosure of actions already undertaken to conserve priority species  
37 were found in the Biodiversity Action Plan of the Oxford City Council which stated:  
38 “Ecological surveys submitted with applications are scrutinised by a professional ecologist  
39 and conditions are used to secure mitigation or enhancement where this is appropriate.  
40 Oxford City Council uses GIS to flag up key biodiversity information such as designated sites  
41 and protected and notable species and habitats” (Oxford City Council, 2015, p. 22).  
42

43 Proposals for raising public awareness and the processes used to monitor the progress  
44 achieved in the implementation of the strategy were disclosed slightly more (respectively by  
45 11% and 14% of the local councils). Examples of disclosure on proposals for raising public  
46 awareness have been found in the website of the Arun District Council (2016) which stated  
47 that it aims to raise awareness of biodiversity importance “through education, social activity,  
48 research and other appropriate means”. Descriptions of processes used to monitor the  
49 progress achieved in the implementation of biodiversity conservation strategy have been  
50 found in the website of the Sheffield Metropolitan Council (2015), which for this purpose  
51 mainly relies on the Sheffield Biological Records Centre (SBRC). In particular, it stated that  
52 they evaluate the efficacy of conservation efforts by “using the data in SBRC and through  
53 undertaking annual habitat and species surveys on local nature reserves and local wildlife  
54 sites”.  
55

56  
57 Interestingly, information about the main sources of funding of biodiversity conservation  
58 actions and the estimates of the associated costs were rarely disclosed. Only 5% and 2%,  
59 respectively, of the local councils analysed provided such disclosures. For example, the  
60

1  
2  
3 Harrow Borough Council in its Biodiversity Action Plan (2015, p. 26) stated that “Most of  
4 the actions in the BAP can be met from existing revenue and capital budget of the Council.  
5 Where the need for additional funding has been identified or becomes apparent during the  
6 course of this plan, this will be sought from external sources identified under funding strategy  
7 ... and any other funders that become available during the term of this plan”. It also provides  
8 details of ‘cost implication’ of the actions planned to achieve biodiversity conservation. For  
9 instance, it disclosed that ‘cost implication’ for the survey to “Review Local SINC  
10 designations through the Local Plan” ... “are estimated at £ 45,000” (Harrow Borough  
11 Council, 2015, p. 36).

12  
13 Disclosure of the evaluation of biodiversity is generally poor. The names of local priority  
14 habitats and local priority species (i.e. local habitats/species threatened of biodiversity loss  
15 and requiring conservation) were the information disclosed the most, respectively by 109  
16 (32%) and 90 (26%) local councils. Local councils disclosed whether these priority habitats  
17 and species were also considered priority habitats and species at national levels less often  
18 (only in 14% and 12% of the cases analysed, respectively). Very few local councils (8%)  
19 disclosed specific details of the local priority species living in local priority habitats. An  
20 example of this disclosure is provided in figure 3 found in the Biodiversity Action Plan of the  
21 Wakefield Metropolitan Council (2015, p. 30).

### 22 23 24 25 INSERT FIGURE 3

26  
27 The disclosure of the size of these priority habitats and the population of these priority  
28 species was generally neglected. Only 41 (12%) and 12 (3%) local councils, respectively,  
29 disclosed such information. The lack of information on these categories could be due to data  
30 unavailability. Indeed, several local councils acknowledged the incompleteness of data  
31 mapping of local biodiversity and had as one main objective of their biodiversity strategies  
32 the collection of data to record the presence, location and size of priority habitats and species.  
33 Hopefully, the achievement of this objective will lead to an improvement in the disclosure of  
34 location and size of priority habitats and species. So far only 18 local councils (5%) reported  
35 information on the progress achieved in the implementation of their biodiversity strategies.  
36 Cherwell District Council is one of the few councils that disclosed this kind of information.  
37 For each of the main objectives of its strategy, it disclosed the progress achieved so far. For  
38 instance, in relation to the objective to “Support and promote initiatives to encourage  
39 involvement in the natural environment and improve public understanding of biodiversity”,  
40 the council had the target to “Organise and promote a Countryside Forum - attendance > 50,  
41 satisfaction rating >75%” and stated that “The target was not achieved” because, as explained  
42 by the council “staff resource for this was too limited” (Cherwell District Council, 2015, p.  
43 23).

#### 44 45 46 47 4.3. *Univariate and multivariate analysis*

48 Table 3 reports the correlations between all the variables used in the analysis. It shows that  
49 the level of Biodiversity Disclosure is significantly positively associated with the number of  
50 inhabitants of the local councils, the presence of local Environmental NGOs, poor  
51 biodiversity management, the visibility of the local councils and their per capita income,  
52 while it is significantly negatively associated with the two-tier local council structure. Some  
53 significant and highly correlated coefficients ( $>|0.4|$ ) have been found between the  
54 independent variables, in particular between the variables Visibility, Environmental NGOs,  
55 local council area, Environmental NGOs, Per capita income and Two-tier council. Despite  
56  
57  
58  
59  
60

the presence of these correlations, multicollinearity is unlikely to be a concern as the VIF values<sup>4</sup> (see table 4) are lower than 2.5 (Gujarati, 2009).

#### INSERT TABLE 3

Table 4 reports the results of the regression analyses performed in order to test our hypotheses.

#### INSERT TABLE 4

Our results provide support for all the six hypotheses tested, except for H2. Local councils' political ideology (H3) and visibility (H6) seem to be the most significant drivers of biodiversity disclosure in the English public sector, followed by the presence of Environmental NGOs in the local council area (H5), poor biodiversity management (H4) and the number of local councils' inhabitants (H1). By contrast, the level of political competitions within local councils does not seem to have a significant impact on biodiversity disclosure.

Indeed, table 4 shows that biodiversity disclosure is significantly higher in local councils where the presence of councillors elected from environmentally-oriented parties is greater. The coefficient of the variable political ideology is positive and significant ( $Z = 2.59$ ,  $p .01$ ), providing support to H3. The citizens of councils where environmentally-oriented parties are more represented give greater importance to environmental values than other political issues. In line with the assumptions of stakeholders, legitimacy and institutional theories, our results suggest that local councils with a greater representation of environmentally-oriented parties disclose more information on biodiversity to show their citizens their compliance with the values of the society they represent.

Table 4 also shows that biodiversity disclosure is significantly higher in local councils based in the London area ( $Z = 3.59$ ,  $p .01$ ), giving empirical support to H6. This is probably because these councils are subjected to a higher visibility than councils located in the other English area. This result supports legitimacy theory, according to which organisations' visibility increases organisations' need to seek legitimacy and use disclosure as an instrumental response to legitimacy pressure.

Our results also show that biodiversity disclosure is significantly higher in local councils where biodiversity has been poorly managed ( $Z = 2.32$ ,  $p .05$ ). H5 is thus supported. The presence of protected sites with irretrievably lasting damages in the local council area has been considered as an indicator of poor biodiversity management. This result also supports the assumption of legitimacy theory, by suggesting that local councils where biodiversity has been poorly managed use biodiversity disclosure to reduce external criticism of their biodiversity strategies and to restore their legitimacy.

In line with stakeholder theory, table 4 also shows that the presence of Environmental NGOs is positively and significantly associated with a greater level of disclosure of biodiversity-related information ( $Z = 2.25$ ,  $p .05$ ), providing support for H4. Local environmental NGOs are powerful stakeholders concerned about the conservation of local biodiversity. English local councils might disclose more information on biodiversity when NGOs are present to discharge their accountability toward these environmental oriented stakeholders.

Table 4 also shows that the coefficient of the variable Population is positive and significant ( $Z = 1.95$ ,  $p .1$ ), giving empirical support to H1. Highly populated local councils are likely to disclose more biodiversity information. This result is in line with agency theory which

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<sup>4</sup> Variance inflation factors (VIFs) are the ratios of variance in a model with multiple terms, divided by the variance of a model with one term alone. They are used to quantify the severity of multicollinearity in an OLS regression analysis (Gujarati, 2009).

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3 suggests that in the presence of greater information asymmetry, as in councils with more  
4 population, the demand for information is higher. Local councils responded to this demand  
5 by disclosing more information on biodiversity in their websites.

6  
7 However, we did not find support for H2. Our results show that biodiversity disclosure is  
8 higher when political competition is lower, although not significantly. This could be because  
9 in a situation of low competition, the governing party is more confident of its position and,  
10 consequently keener to disclose information.

11 All together these results show that biodiversity disclosure seems to be driven by social  
12 incentives. Local councils use biodiversity disclosure to satisfy the information needs of their  
13 citizens and stakeholders and to show compliance with the expectations of the society in  
14 which they operate and the communities which they represent.  
15

## 16 17 **5. Discussion and Conclusion**

18 This study explores the extent of biodiversity reporting within the English local government  
19 using a multi-theoretical framework composed of agency, stakeholder, legitimacy and  
20 institutional theories. It investigates the factors associated with the level of biodiversity  
21 disclosure. By investigating biodiversity reporting in organisations operating in the public  
22 sector, this study extends the literature on sustainability accounting which has investigated  
23 mostly the corporate sector and has largely ignored public sector biodiversity issues.

24 This study's main results show that the importance of biodiversity is not acknowledged by  
25 the majority of the local councils analysed. The information they disclose does not allow  
26 interested stakeholders to get a comprehensive picture of the current status and future  
27 development of local biodiversity. The extent of biodiversity disclosure found in the context  
28 of English local councils is lower than the level of disclosure found by previous studies  
29 conducted in the public sector (Barut and Azim, 2016) and in the corporate sector (e.g. Adler  
30 et al., 2018; Atkins et al., 2014; Rimmel and Jonäll, 2013). English local councils  
31 demonstrate a weak response to the demand for accountability and transparency on  
32 biodiversity. As stated by Jones (2014) one essential aspect of biodiversity accounting is the  
33 disclosure of biodiversity information. Local councils should act as stewards of the  
34 environment and have regard to the conservation of biodiversity in order to guarantee the  
35 well-being of the communities they represent. How and to what extent local councils disclose  
36 biodiversity-related information is thus extremely important in order to evaluate their  
37 stewardship (Jones, 2003; 2014; Schneider et al. 2014).  
38

39 Empirical results suggest that most local councils do not provide sufficient information to  
40 allow an assessment of their accountability. Most local councils do not report any information  
41 about local biodiversity. When disclosed, biodiversity information is limited. Relevant  
42 aspects such as the current status of habitats and species threatened, particularly in terms of  
43 size and population, are generally ignored. Moreover, while several councils outline generic  
44 objectives and tables of actions to be met in order to conserve and maintain biodiversity,  
45 almost no local council disclosed information on how they implement such policies and  
46 action plans and on the progress achieved in pursuing their strategic objectives. This aspect  
47 raises the concern that local council might use biodiversity reporting as a tool to manage their  
48 stakeholders' impression rather than to improve transparency, in line with the findings of  
49 Boiral (2016) in the private sector.  
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51 Our study is, to our knowledge, one of the first that provides empirical evidence of the factors  
52 that affect the extent of biodiversity disclosure. It shows that, as predicted, the differences  
53 that exist among English local councils regarding their biodiversity disclosures practices are  
54 explainable by economic and social theories. In line with agency theory (Zimmerman, 1977),  
55 we found that biodiversity disclosure is significantly higher in local councils with a higher  
56 population. We also found that biodiversity disclosure is significantly associated with the  
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political ideology of the local community, the presence of Environmental NGOs, poor biodiversity management practices and the visibility of the local council. These results are in line with the assumptions of social theories, such as stakeholder, legitimacy and institutional theories, which explain the disclosure of information as a tool used to manage the relationships between organisations, the state, individuals and groups (Campbell, 2007; Deegan and Blomquist, 2006; Gray, 1995; Guthrie and Parker, 1989). In determining their biodiversity disclosure, local councils consider their institutional context (i.e. the environmental values of the community they represent) and the interest of their stakeholders. Local councils need their stakeholders (such as voters, environmental NGOs and local communities) to support the biodiversity conservation strategies adopted, and try to obtain this support by disclosing biodiversity related information. Local councils seem to use biodiversity disclosure as part of the dialogue between them and their stakeholder for double purposes: to inform the latter about the (actual) changes in their biodiversity performance and activities and also to seek to change their perceptions on their biodiversity management strategies, when their biodiversity management has been poor. Biodiversity disclosure is used by local councils to satisfy the information needs of their stakeholders and assure them that their strategies and practices conform to their values and expectations. In doing so, local councils present an environmentally responsible image to their community, legitimise their behaviours to their main stakeholder groups and influence their external perception of reputation.

Overall our findings expand the emergent literature on biodiversity reporting in different ways (e.g. Adler, 2017, 2018; Atkins et al., 2014; Barut and Azim, 2016; Boiral, 2016; Gaia and Jones, 2017; Rimmel and Jonäll, 2013; Samkin et al., 2014; Schneider et al., 2014; van Liempd and Busch, 2013). First, our study contributes to this literature as it contains new and significant information on the nature and content of biodiversity disclosures in the public sector and provides a self-constructed disclosure index that may provide an important reference for future studies of biodiversity disclosures. Second, it enhances our understanding of the responsibilities of public sector agencies for the management of biodiversity, which is a growing area of work in the field of accounting and a central challenge of sustainability development. Third, it is to our knowledge one of the first studies that, using a theoretical framework that relies on economic and social theories, empirically investigates the factors associated with the disclosure of information on biodiversity. In this way, it also contributes to the scant literature on sustainability reporting in the public sector (e.g. Guthrie and Farneti, 2008; Guthrie et al., 2010; Joseph et al., 2014; Linch, 2010; Sanchez, 2013; Tagesson et al., 2013). It shows that the disclosure of biodiversity information by local councils is explained by their need to conform with society and to satisfy the information needs of the relevant stakeholders.

As with any study, we acknowledge that this study is subject to a number of limitations. First, we analysed biodiversity reporting in a single institutional setting. Although the results derived from English local councils can be generalised to other developed countries a more comprehensive portrait would be obtained by studying additional countries. Second, this study assumes that the websites of local councils are the primary medium for communicating biodiversity information. Our assumption is based on fact that the Environmental Information Regulations (EIR) 2004 requires public authorities to disclose environmental information using electronic means, whenever possible. For this reason, it is likely that local councils use mainly their websites to report biodiversity-related information to the citizens. However, it is possible that local councils disclosed biodiversity-related information using other means that were not accessible through their websites, such as printed documents, letters or emails, or that were not captured by our disclosure index, such as sound or video recordings. Future studies might investigate disclosure in the public sectors by analysing these other means of

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3 disclosure. Third, our study focused on the level of disclosure provided by local councils, but  
4 not whether (and how) they ‘managed’ biodiversity disclosures through impression  
5 management techniques. Indeed, Boiral (2016) found that corporations use biodiversity  
6 disclosure positively to manage the stakeholders’ impressions, rather than to improve  
7 transparency. Further research might address this issue in the public sector. Fourth, our study  
8 has mainly focused on how accountability relations between politicians, citizens and  
9 environmental NGOs shape biodiversity disclosure. However, local council information  
10 disclosure might be affected also by accountability relations with other relevant stakeholders,  
11 such as national governments. Future studies should take these accountability relationships  
12 with other stakeholders into account in investigating disclosure in the public sector.

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14 Last but not least, we acknowledge that most of our hypotheses would greatly benefit from  
15 being tested against complementary qualitative studies that interview local councils’  
16 representatives to investigate their perceptions on the role played by the factors analysed in  
17 this study on the development of biodiversity reporting practices. Future research is also  
18 encouraged in this perspective.

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20 In spite of these limitations, this study provides valuable insights and has a number of  
21 relevant practical and policymaking implications. By showing evidence of the limited  
22 disclosures on biodiversity provided by English local councils, this study suggests that the  
23 current provisions by policymakers to place a duty on local authorities to have regard of  
24 biodiversity is not sufficient. They should also mandate that these authorities should publish  
25 periodical reports aimed at informing their citizens on the current status of local biodiversity,  
26 the actions undertaken to preserve the biodiversity and the progress achieved in this direction.  
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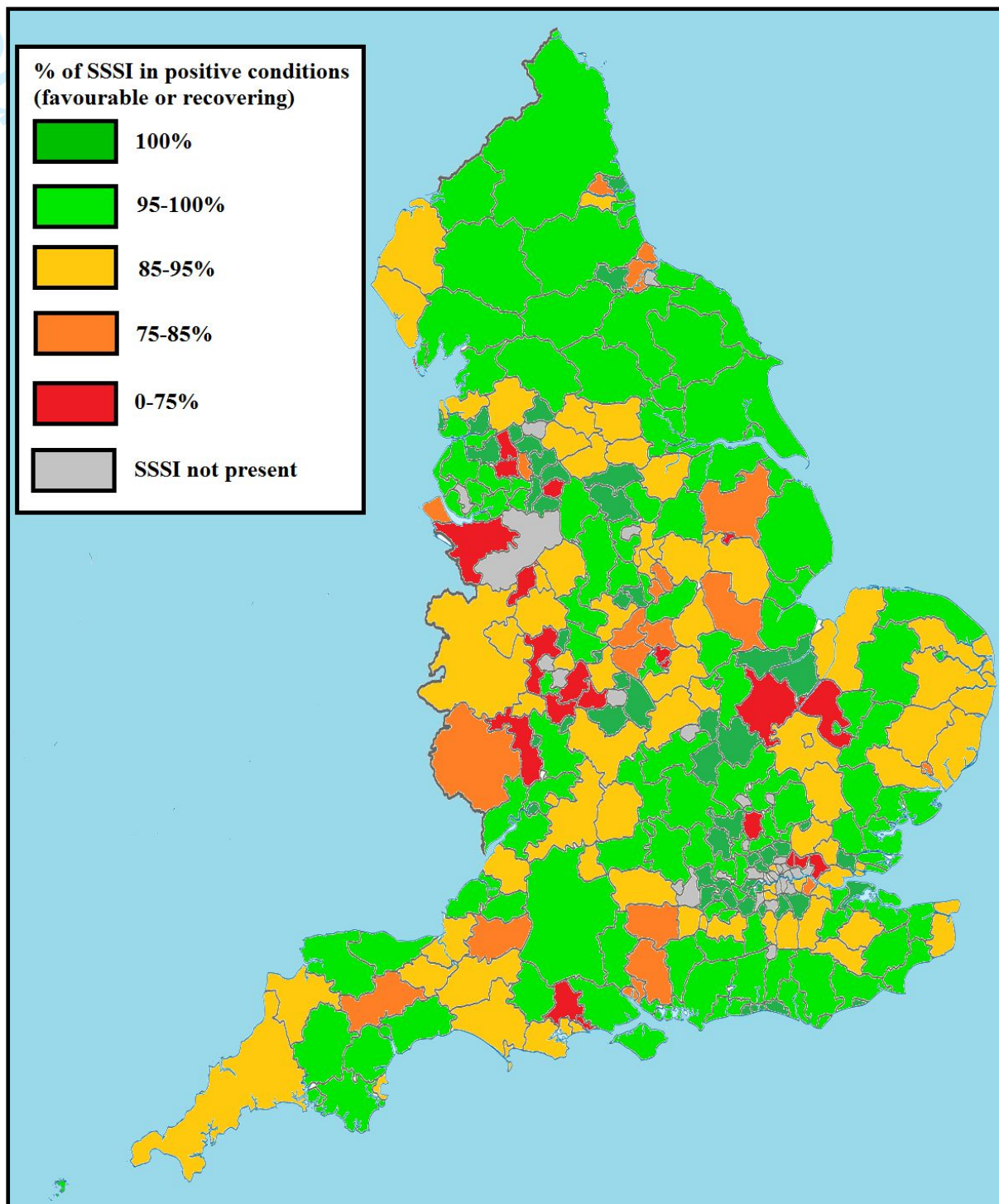
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3 Wakefield Metropolitan Council (2015), "Wakefield Local Biodiversity Action Plan",  
4 available at [http://www.wakefield.gov.uk/Documents/sports-leisure/parks-](http://www.wakefield.gov.uk/Documents/sports-leisure/parks-countryside/biodiversity-action-plan.pdf)  
5 [countryside/biodiversity-action-plan.pdf](http://www.wakefield.gov.uk/Documents/sports-leisure/parks-countryside/biodiversity-action-plan.pdf) (accessed 20<sup>th</sup> December 2015).  
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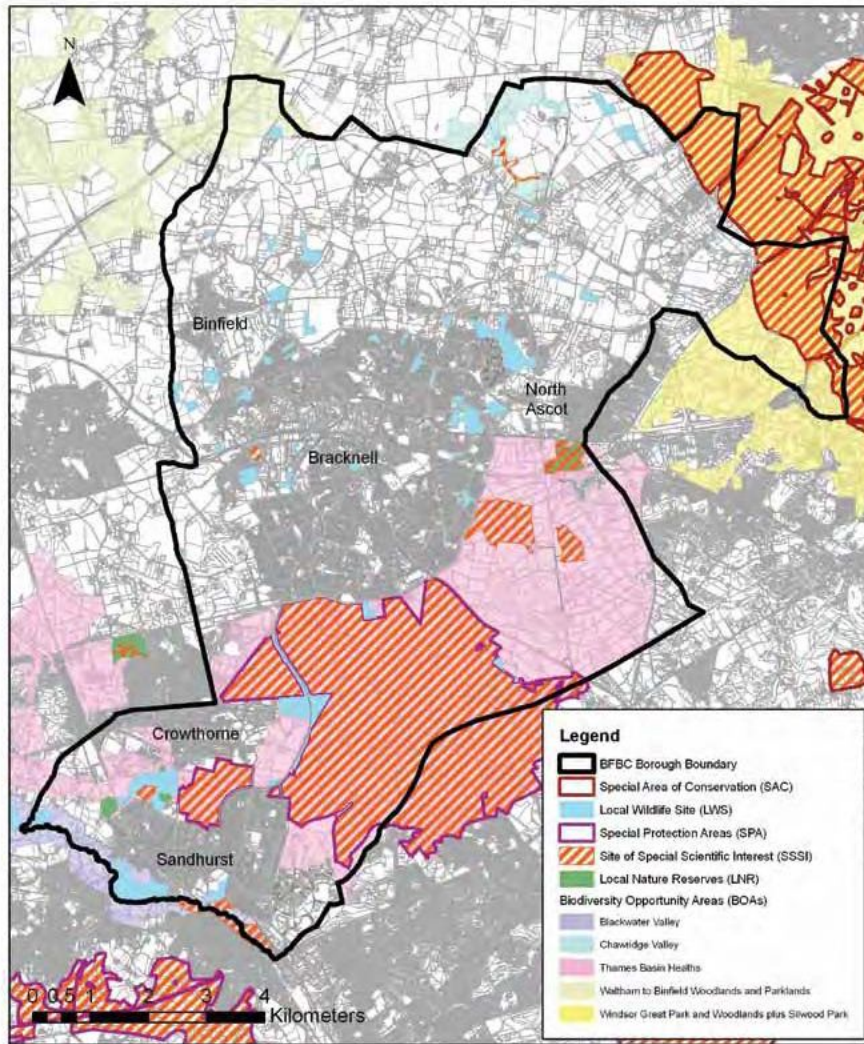
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**Figure 1:** Map of English Local councils classified according to the status on their SSSI. Source: Our elaboration using the data available from Natural England (2015).





**Figure 2:** Example of a biodiversity maps showing the locations of the sites of natural interest in the local council's area. Source: Bracknell Forest Council (2012, p. 91).

Priority Habitats and Associated Key Priority Species

HABITAT	PLANTS	BIRDS	BATS	OTHER MAMMALS	INVERTEBRATES	AMPHIBIANS & REPTILES
Ponds, Lakes, Canals		Teal, Shoveler, Pochard, Bittern, Lapwing, Snipe, Curlew, Reed Bunting, Reed Warbler, Willow Tit, Cetti's Warbler, Swift	Daubenton's, Natterer's, Noctule, Common Pipistrelle, Soprano Pipistrelle	Water Vole, Water Shrew, Otter	Emperor Dragonfly, Common Hawker, Banded Demoiselle	Great Crested Newt, Palmate Newt, Grass Snake, Common Frog, Common Toad FISH Eel
Rivers and Streams		Yellow Wagtail, Willow Tit, Cetti's Warbler		Otter	White-clawed Crayfish, Banded Demoiselle	FISH - Salmon, River Lamprey, Eel
Deciduous Woodland	Wild Service Tree, Spindle Tree, Bluebell	Lesser Spotted Woodpecker, Song Thrush	Natterer's, Noctule, Leisler's, Brandt's, Brown Long-eared	Badger	Purple Hairstreak, White-letter Hairstreak	Grass Snake
Hedgerows	Spindle Tree, Wild Privet	Grey Partridge, Skylark, Barn Owl, Yellow Wagtail, Tree Sparrow	Whiskered, Common Pipistrelle, Soprano Pipistrelle	Badger	Brimstone, White-letter Hairstreak	
Magnesium Limestone Grassland	Pyramidal Orchid	Skylark			Grayling	
Unimproved Neutral Grassland		Skylark, Barn Owl, Grey Partridge, Lapwing			Short-winged Conehead Bush Cricket	
Unimproved Acid Grassland		Skylark, Barn Owl, Grey Partridge, Lapwing			Dingy Skipper	
Lowland Heathland		Skylark	Common Pipistrelle, Noctule		Grayling, Brown Argus	
Walls and Quarry Faces	Spleenworts		Common Pipistrelle, Soprano Pipistrelle			Grass Snake

**Figure 3:** Examples of disclosure of the local priority species living in local priority habitats  
Source: Wakefield Metropolitan Council (2015, p. 30).

**Table 1 – Descriptive statistics**

Variable	Mean	Std. Dev.	Min	Max
BDI	15.87	22.84	0.00	93.55
Population	211,640.90	213,374.90	34,675.00	1,500,000.00
Political competition	40.05	24.83	0.00	100.00
Political ideology	12.80	15.08	0.00	90.91
Environmental NGOs	0.0001	0.0001	0.00	0.0004
Poor biodiversity management	0.14	0.97	0.00	14.35
Visibility	0.09	0.29	0.00	1.00
Local council area	62,276.17	104,779.00	1,213.00	803,761.00
SSSI	2.42	4.65	0.00	53.57
Per capita income	29,966.95	9,389.88	20,400.00	131,000.00
Two-tier council	0.65	0.48	0	1

**Table 2 – Biodiversity disclosure index – breakdown per subcategories**

<b>1. Scene setting</b>	<b>No</b>	<b>%*</b>	<b>%**</b>	<b>Source</b>
Biodiversity definition	149	42.45	86.63	Atkins et al., (2014)
Acknowledgement of the broader problems of biodiversity loss	130	37.04	75.58	Samkin et al (2014); Schneider et al. (2014)
Broad categorisation of the local council area by habitat type	130	37.04	75.58	UKBG, 1995; UK LIAG, 1997
Regulatory Framework	116	33.05	67.44	Samkin et al (2014)
Information about local sites of natural interest present in the council area	116	33.05	67.44	UKBG, 1995; UK LIAG, 1997; Schneider et al. (2014)
A biodiversity maps showing locations of the above key areas	84	23.93	48.84	UKBG, 1995; UK LIAG, 1997
Review of generic issues affecting biodiversity within the local area	73	20.8	42.44	UKBG, 1995; UK LIAG, 1997
<b>2. Strategic planning</b>				
The vision	60	17.09	34.88	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007; Atkins et al., (2014); Samkin et al (2014)
The strategical objectives	56	15.95	32.56	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007; Schneider et al. (2014)
The time-horizon	54	15.38	31.4	UKBG, 1995; UK LIAG, 1997
Presence of specific habitats action plans	43	12.25	25	UKBG, 1995; UK LIAG, 1997
Recommended actions to achieve the strategical objectives	31	8.83	18.02	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007
Presence of specific species action plans	30	8.55	17.44	UKBG, 1995; UK LIAG, 1997
<b>3. Implementation</b>				
Indication of the partner involved in the strategy implementation	61	17.38	35.47	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007; Atkins et al., (2014); Samkin et al (2014)
Processes used to monitor the progresses of the strategy	50	14.25	29.07	UKBG, 1995; UK LIAG, 1997; Samkin et al (2014);
Description of the work of the partnership	48	13.68	27.91	UKBG, 1995; UK LIAG, 1997
The criteria used to identify local priority habitats	43	12.25	25	UK LIAG, 1997
The criteria used to identify local priority species	41	11.68	23.84	UK LIAG, 1997
Proposals for raising public awareness on biodiversity importance	40	11.4	23.26	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007
Action already underway to meet the conservation requirement of the priority habitats	25	6.98	14.24	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007
Action already underway to meet the conservation requirement of the priority species	22	6.13	12.5	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007
Source of funding	18	5.13	10.47	UKBG, 1995; UK LIAG, 1997
Estimates costs	6	1.71	3.49	Atkins et al., (2014); Samkin et al (2014)
<b>4. Evaluation</b>				
Identification of the priority habitats of the local council area	109	31.05	63.37	UKBG, 1995; UK LIAG, 1997
Identification of the priority species of the local council area	90	25.64	52.33	UKBG, 1995; UK LIAG, 1997

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3	Whether the priorities habitat of the local council area are also priority habitat at	49	13.82	28.2	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007
4	national level				
5	Whether the priorities species of the local council area also priority species at national	44	12.39	25.29	UKBG, 1995; UK LIAG, 1997; DEFRA, 2007
6	level				
7	Size of the priority habitats	44	12.39	25.29	UKBG, 1995; UK LIAG, 1997
8	List of priority species in priority habitats	28	7.83	15.99	UKBG, 1995; UK LIAG, 1997
9	Progress achieved in the implementation of the strategy	18	5.13	10.47	UKBG, 1995; UK LIAG, 1997; Atkins et al.,
10					(2014); Samkin et al (2014); Schneider et al. (2014)
11	Population of the priorities species of the local council area	12	3.28	6.69	UKBG, 1995; UK LIAG, 1997
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15	Notes:				
16	* Percentage calculated on the total local councils analysed (351)				
17	**Percentage calculated on the local councils that disclosed at least some biodiversity information (172)				
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Table 3 – Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11
1. BDI	1										
2. Population	0.1912*	1									
3. Political competition	0.0812	0.0062	1								
4. Political ideology	0.0891	-0.0224	-0.2410*	1							
5. Environmental NGOs	0.1377*	-0.0499	0.0667	-0.0288	1						
6. Poor biodiversity management	0.1149*	0.0757	0.0553	-0.0274	-0.0341	1					
7. Visibility	0.2710*	0.1583*	0.1274	-0.1257	0.4277*	-0.0478	1				
8. Local council area	-0.0746	0.2967*	-0.1788*	0.0876	-0.3889*	0.0146	-0.4301*	1			
9. SSSI	-0.0631	-0.0958	-0.1115	0.0888	-0.0516	-0.0283	-0.0884	0.1072	1		
10. Per capita income	0.1708*	-0.0754	0.0825	0.0815	0.5456*	-0.0788	0.3726*	-0.1056	-0.0675	1	
11. Two-tier council	-0.1772*	-0.3480*	-0.1269	0.1246	-0.2197*	-0.094	-0.4337*	0.3598*	0.0144	0.0196	1

\* p < 0.01

Table 4 – Regression analyses

Hypotheses	Expected sign	Independent and control variables	Z value
H1	+	Population	1.95 *
H2	-	Political competition	1.20
H3	+	Political ideology	2.59 ***
H4	+	Environmental NGOs	2.25 **
H5	+	Poor Biodiversity Management	2.32 **
H6	+	Visibility	3.59 ***
		Local council area	0.01
		SSSI	-0.79
		Per capita income	1.51
		Two-tier council	-0.52
		Constant	-1.64
		No Obs	351
		R2	0.1364
		F	5.37 ***
		Average VIF	1.34
		Max VIF	1.92

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

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**Response to Reviewers' Comments. Accounting, Auditing & Accountability Journal, ref no: ID AAAJ-05-2018-3472 entitled "Biodiversity reporting. Evidence from English local councils"**

Reviewer # 1 comments	Our responses
I have carefully looked at the responses from the authors and the changes and additions they have made in their manuscript, and I am satisfied with them. I thus would like to recommend the paper for publication. Thank you for giving me the opportunity to review this interesting paper.	We are happy that you are satisfied with our responses and the amendments made on the previous version of the paper. Thank you for your very useful comments.
Reviewer # 2 comments	Our responses
	We thank Reviewer # 2 for the helpful and insightful comments on our paper. We detail below how we have dealt with each comment.
In the abstract, the authors may wish to clarify how their work contributes to specific theories rather than using the generic term 'economic and social theories'.	We have now added this comment to the end of the abstract thus making it more specific.
Section 2 'Theoretical Framework' has improved substantially. Could the authors ensure that they explain how specific theories have informed each hypothesis? <b>This is mostly visible, however it is less clear in relation to hypotheses 2 and 3. Similarly, it would be useful to include a short summary of how you have integrated these different theoretical perspectives in the generation of hypotheses at the end of section 2 prior to detailing the methodology.</b> Such a summary could comment further on the ways in which the theories interact and complement each other elaborating on the point made on page 5, lines 27-28.	Thank you for your valuable comment. We have taken your suggestions into account by explaining how specific theories have informed each hypothesis, focussing in particular on hypotheses 2 and 3. Please see p. 6. We have also included a summary at the end of section 2, by creating a new paragraph 2.7 (please see p. 8) where we have explained how these theories interact and complement each other. In this summary we have explained that our hypotheses are mainly informed by agency and stakeholder theories as these theories explain the relationship between politicians and citizens and other stakeholders as an agency/stakeholder relationship where the politicians are the agents acting in the interest of the citizens (principals) and the other stakeholders. Disclosure is used by politicians to show that they satisfy the interest of citizens and stakeholders. Thus, disclosure increases when the demand of information is higher (more citizens, more stakeholders interested on biodiversity e.g. environmental NGOs) or when political competition is higher as the need to satisfy the interest of voters becomes more prominent. These theories are then complemented by institutional and legitimacy theories, as



	<p>we argue that the need to satisfy these actors might be driven not only by the mere fact that they monitor politicians because of the potential agency conflict but also because politicians want to show them that they comply with the values of the community they represent and want to maintain legitimacy among them. Hope these amendments satisfy your expectations.</p>
<p>Thank you for providing more detailed information both the institutional setting for local councils with regards biodiversity and reflection on the reliance on local authorities websites as the primary source for biodiversity information. Could the authors suggest other forms of disclosure that local authorities may be using? Also, could the authors consider the extent to which local authorities and elected politicians have other accountability relations to other stakeholders (e.g. national governments) and the extent to which such relations may need to be taken into account in future examinations of disclosure? Stakeholder theory suggests that organisations may be accountable to multiple stakeholders and you have identified citizens and environmental NGOs in this project. It might be useful to also discuss the extent to which national governments, as another stakeholder, shape disclosure.</p>	<p>Thank you for your comment. In the revised version of the paper, we have identified different forms of disclosure, including video, audio recording, printed documents and letters that the local councils might use to inform their stakeholders. We have now illustrated them in the conclusion of the paper (please see p. 21), suggesting future studies to consider them when investigating disclosure in the public sector. Thank you for suggesting us to consider national governments as other stakeholders that could shape local council disclosure. This is definitely a very interesting suggestion and we think future studies should consider their roles in shaping local councils' disclosure. To address your comments, we have listed as one of the limitations of our study the fact that we are considering mainly citizens and environmental NGOs as the most relevant stakeholders of this study. We have acknowledged that other stakeholders, National Government in particular, could shape local council disclosure and suggested future research to consider the role played by National Government in local council disclosure (please see p. 22).</p>
<p>Finally, to strengthen the recommendation for local authorities to be required to periodically disclose biodiversity information, could the authors provide some details of the timeliness of the information provided by local authorities? As it stands, it is not clear whether the information gathered is published in a particular year or has been on the website for an undisclosed period of time. If information has not been updated for a long period of time, this may raise further questions about the extent to which local authorities are meeting their</p>	<p>We do agree that identifying the timeliness of the information available on webpages is important. We did take into account the issue of timeliness of the information provided by the local councils when we analysed the websites. We have mainly considered up to date information to evaluate the level of disclosure provided by local councils. This applies for the information related to sections B. Strategic planning, C. Implementation and D. Evaluation of our biodiversity disclosure index. When we evaluated the level of</p>

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<p>biodiversity duty. I understand that dates of publication may not be readily available on websites, especially for webpage content compared to reports. However, insights into identifying the timeliness of information available on webpages would be important for those wishing to conduct similar research in the future.</p>	<p>disclosure within these areas we have assigned scores of 1 only when the information referred to a current period of time at the time when the data collection was performed (e.g. the website stated the information was related to the period 2015-2016 or the information was found in a strategic plan for the period 2012-2017 or a biodiversity report for the period 2013-2015). We have not been so strict in relation to the first area of disclosure of the biodiversity index "A. Scene settings", as for the items included in this area (e.g. Biodiversity definition; Acknowledgement of the broader problems of biodiversity loss) we thought that the issue of timeless was less important, as the type of information will not significantly change over time. So for these items we also assigned score 1 when we did not have information of the date when the information was published. We have clarified this aspect and provided more detailed information on the data collection in the section 4.2 Findings on biodiversity disclosure at p. 15 and 16 of the revised paper. Thank you for pointing this out.</p>
<p>Please review the manuscript for some minor spelling and grammatical errors. For example,  page 11, line 24 - 'The report also shows' instead of 'The report also show'  page 11, line 41 - 'There are now' instead of 'There are row'  page 13, line 15 - check section numbering for 'Multivariate analysis' section heading.  page 10, lines 32-34 - check this sentence for sense 'However, according to the Environmental Information Regulations (EIR) 2004, that discipline that public access to environmental information held by local authorities...'.</p>	<p>Thank you for identifying these spelling and grammatical errors. We have corrected them in the revised version of the paper.</p>