

**A CORPUS LINGUISTICS ANALYSIS OF ECOSYSTEMS
VOCABULARY IN THE PUBLIC SPHERE
(CLAEVIPS)**

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Section 1. Introduction

This report, commissioned by the NEA, presents the results of a study of over a hundred words and phrases related to ecosystems, and how they are used in public discourse. The study was carried out using UKWaC (see Ferraresi et al. 2008), a corpus of over 1.5 billion words of UK English in the public domain, and three purpose-built specialised corpora of language relating to ecosystems, from a) academic websites, b) government websites and c) newspapers, NGO websites and blogs. These corpora are described more fully in [section 3](#) below. The tool for examining these words was Sketch Engine (see Kilgarriff et al. 2004), an interface which gives profiles of words and the way they co-occur with other words in particular grammatical relationships.

The report is structured as follows: in [section 2](#) we provide a brief overview of the literature in this area; in [section 3](#) we describe the methodology used in this study; [Section 4](#) gives an executive summary of the main findings; and the detailed findings are presented in [section 5](#), where words and phrases are grouped semantically for ease of reference.

Section 2. Summary of literature on ecology and language

Over the past few decades there has been a growing body of research into the language used to discuss environmental issues, and in the 1990s a new discipline, *ecolinguistics*, emerged². At the deepest level, Halliday (2001) has argued that the grammar of English (and other European languages, although all his examples are from English) is inherently problematic with regard to the environment. For example, English prioritises large size so much that the ‘large’ word is always the default: we ask ‘how big/tall/long/heavy is it?’ but rarely ‘how small/short/light is it?’ This embedded notion that largeness is the norm is furthered by the positive connotations of words such as *grow* (in comparison with the more negative *shrink*), so that sentences such as ‘traffic is growing’ are coloured by positive associations. Halliday also gives the example of uncountable nouns: resources such as *water* and *oil* are grammatically uncountable, with the implication that they are unlimited.

More specifically, linguists have analysed the grammar of particular texts which discuss environmental issues. One key area of interest is grammatical agency; that is, whether or not a clause specifies an agent which carries out the action of the verb. For example, the following are different realisations of the same underlying structure:

- ‘cars emit greenhouse gases’ (active – the agent is ‘car’);
- ‘greenhouse gases are emitted’ (passive – no agent);
- ‘greenhouse gas emissions’ (nominalised – no agent).

Several scholars (Schleppegrell 1997, Goatly 2001 and Kuha 2007 among others) have examined the extent to which passive and nominalised forms – of the type shown in examples b) and c) – are used in texts about the environment so as to avoid ascribing agency – and thus responsibility – to people, organisations, or practices. Nominalisation is also used to suppress references to those who are affected: *habitat loss* fails to tell us which animals are losing their habitats (Schleppegrell 1997), while *slaughtering operation* does not specify who or what is being killed (Goatly 2001). Pragmatic features and discourse markers have also been subject to analysis. For example, Kuha (2009) analyses statements about global warming in US newspapers and whether they present climate change and its causes as a certainty or not, depending on whether they use assertive constructions such as ‘research shows that...’ or tentative propositions such as ‘CO₂ emissions *might be* contributing to climate change...’ These analyses are related to the broader discipline of Critical Discourse Analysis, in which

² It should be noted that *ecolinguistics* refers to two separate but related bodies of research: a) the use of ecology as a metaphor for understanding language and interaction, and b) the language used to talk about the environment (see Fill 2001). We are interested only in b).

grammatical features such as transitivity and modality are frequently studied as a means of understanding power relations and ideology (see e.g. Fairclough 2001; Bloor and Bloor 2007).

Other research has focused on the semantics of words and phrases related to environmental issues. Mühlhäusler (2001) summarises some key areas of interest: semantic vagueness, e.g. terms like *pollution*, *progress* and *pest*, which mean different things to different people; semantic underdifferentiation, e.g. the verb *grow*, which does not distinguish between natural and man-made growth or arithmetic and exponential growth; misleading encoding, e.g. *fertilizers*, which can make soil infertile; and euphemism, e.g. *wastewater* for *sewage*. More recently, Dillon (2010) discusses the variable interpretations of words like *nature*, *culture* and *value*, and argues that they could lead to miscommunication between different interest groups: for example, a local community might interpret an area's 'natural values' as its aesthetics, while economists might argue that its 'values' are its resources, e.g. its timber.

Another useful area of research is the examination of public discourse as a way of determining perceptions of and attitudes towards environmental issues. For example, Nerlich and Koteyko (2009) survey the recent explosion of compounds with *carbon*, such as *carbon footprint*, *carbon offset*, *carbon finance*, *carbon diet* and *carbon indulgence*. By exploring the use of such compounds in blogs and newspapers, they offer a glimpse of the way that the public perceives climate change and carbon offsetting. In particular, they discover that *carbon indulgence* evokes a frame of sin and repentance, and is frequently used in cynical statements to the effect that carbon offsetting is simply a way of allowing pollution but mitigating guilt.

Our study aims to analyse words and phrases associated with ecosystems and discover their key collocates, positive and negative usages, and connotations. The vocabulary studied was determined at the commencement of the project by the authors and the NEA.

Section 3. Methodology and corpora

The following methodology was used:

1. For individual words, the most salient collocates were examined using the word sketch tool in the Sketch Engine. (This tool is described in the CLAEVIPS project proposal, March 2010.) Salient collocates (also called key collocates, or strong collocates) are other words that occur in close proximity to the given word in a statistically significant way. Collocates were compared across UKWaC and three specialised corpora (see below).
2. For all words and phrases, a random sample of 100 citations in UKWaC was analysed to find out:
 - a. if the word or phrase tended to be used in subjective or objective statements;
 - b. if the word or phrase tended to be used positively, neutrally or negatively;
 - c. any other interesting tendencies about the use of the word.
3. For phrases, which cannot be examined using word sketch, additional analyses were carried out of random samples of 50 citations in each of the specialised corpora.
4. Frequencies per 10,000 words were calculated for each word and phrase in each corpus. Frequencies are given in the [appendix](#).
5. Based on the results of the preceding steps, some words were selected for additional analysis. These words (marked *) were compared with other similar words in UKWaC, using the thesaurus and sketch-diff tools in the Sketch Engine (again, these tools are described in the project proposal).
6. The study was carried out by two researchers (the two authors). Three keywords were analysed by both researchers to ensure consistency, and there was substantial overlap between their findings.

The corpora used in the study were:

1. General corpus: UKWaC, a corpus of over 1.5 billion words from internet domains ending in .uk.³ (For more information, see Ferraresi et al. 2008.)
2. Specialised corpora: three smaller custom-built corpora of language related to ecosystems, for comparison with UKWaC, each consisting of approximately 1.5 million words:
 - a) CLAEVIPS_academic, from domains ending in .ac.uk
 - b) CLAEVIPS_government, from domains ending in .gov.uk
 - c) CLAEVIPS_public, from a selection of news websites, NGO websites and blogs: .bbc.co.uk; .telegraph.co.uk; .timesonline.co.uk; .guardian.co.uk; .thesun.co.uk; .dailyrecord.co.uk; .blog.co.uk; .foe.co.uk; .rspb.org.uk; .woodlandtrust.org.uk; .greenpeace.org.uk; .wwf.org.uk; .nationalgeographic.co.uk; .nationaltrust.org.uk; .theecologist.org.

Each of these corpora was created by searching the web for sites in the relevant domain which contained at least three of the following 'seed' words/phrases:

ecosystem, ecosystems, ecosystem approach, ecosystem services, habitat, habitats, biotope, biodiversity, geodiversity, diversity, biome, biosphere, ecology, ecological, environment, environmental, environmentally, geology, biology, biological, biogeography, agriculture, agricultural, organism, species, flora, fauna, vegetation, plant, wildlife, population, wetland, freshwater, woodland, hedgerow, forest, deforestation, rainforest, grassland, heathland, savanna, savannah, desert, reef, ocean, aquatic, terrestrial, coastal, marine, urban, rural, soil, landscape, wilderness, topography, farmland, fishery, countryside, climate, sustainable, sustainability, heritage, national park, reserve, conserve, conservation, management, pollute, pollution, dynamics, interaction, resource, economy, economic, nature, natural, natural capital, semi-natural, man-made, native, indigenous, invasive, green, cultural, cultural heritage, cultural diversity, popular culture, value, science, expert, expert knowledge, specialist, natural history amateur, professional, voluntary, conservation group, Wildlife Trust, National Trust, RSPB, extinction, damage, destruction, loss, change, climate change, land-use change, politics, green space, greenspace, open space, urban park, allotment, garden, landscape garden, commons, right-to-roam, access, public access, recreation, beauty, solitude, peacefulness, freedom, independence, fear, anxiety, spiritual, attachment, sense of place, greenhouse effect, global warming.

In addition, so as to avoid the inclusion of irrelevant material, each site had to include at least three occurrences of the following:

ecological, environmental, sustainable, natural capital, ecosystem, ecosystems, pollution, sustainability, biodiversity, climate, conservation, ecology, environment, fauna, flora, grassland, habitat, heathland, organism, species, vegetation, wetland, wildlife, woodland, rainforest, deforestation, geodiversity, biome, biosphere, ecosystem approach, ecosystem services, biotope, pollute, semi-natural, green, right-to-roam, natural history, conservation group, Wildlife trust, National Trust, RSPB, extinction, extinct, climate change, land-use change, green space, greenspace, open space, urban park, allotment, landscape garden, public access, greenhouse effect, global warming.

The table in the [appendix](#) shows the raw frequencies, and frequencies per 10,000 words, of all the words used to build the specialised corpora, as well as additional derivatives which were not used as seeds but were analysed in the study. Frequencies are shown for all four corpora.

³ Note that throughout this report, references to numbers of *words* includes numerals, punctuation marks etc., and correspond to what are called *tokens* in linguistics.

It should be noted that comparisons cannot be made between UKWaC and the specialised corpora, since the frequencies in the specialised corpora are inevitably higher, given that the words in question were used to create the specialised corpora. Comparisons can be made between the three specialised corpora, but with caution, since it is possible that a given word was selected as a seed in the automatic creation of one corpus, but not in another. However, general tendencies can be inferred: for example, the fact that *peacefulness* does not occur in any of the specialised corpora suggests that it is not a frequent word in the language of ecosystems.

Section 4. Executive summary of findings

The following are the main findings of the study:

1. **Words/phrases not widely used or understood:** There was evidence that several of the words and phrases under analysis are not widely used, in that they are very infrequent in the corpora, or that they tend to appear only in book titles or other limited sources. These include [biome](#), [ecology](#), [biotope](#), [popular culture](#) and [biogeography](#). Others appear to be new and not yet widely understood, in that they are often presented in inverted commas (e.g. ‘the US consumes “natural capital” at about the average rate’) or with an accompanying explanation (e.g. ‘Biodiversity is a term which simply means “the variety of life”’). See [ecosystem approach](#), [biodiversity](#), [geodiversity](#) and [natural capital](#).

2. **Differences between the specialised corpora:** Although there was a lot of overlap between the three specialised corpora, there were also significant differences in the kinds of issues that recurred. In particular, the public corpus (of newspapers, NGO websites and blogs) included many more references to rainforests, forests and climate change. See [climate change and global warming](#), [rainforest](#), [man-made](#), [destroy](#) and [loss](#). There are also many differences between the corpora in terms of the most salient collocates and recurrent phrases. These cannot all be mentioned here, but some examples are that *conservation concern* is frequent in the government corpus but not in the academic or public; *collateral damage* and *go green* are found in the public and academic corpora but not in the government; and *climate science* is salient in the public corpus but not in the government or academic corpora. For these examples, see [conservation](#), [damage](#), [green](#) and [science](#).

3. **Promotional use of nature in advertising material:** There is a great deal of evidence of the way that the natural world is used as a selling-point in adverts for holidays, homes and businesses, indicating the highly positive associations of words and phrases such as [environmentally friendly](#), [ecological](#), [eco-](#), [solitude](#), [cultural diversity](#), [savannah](#), [reef](#) and [farmland](#).

4. **Scepticism relating to environmental issues and language:** In both UKWaC and the public corpus, there is evidence of public scepticism, particularly with regards to claims about climate change. See [climate change](#), [expert](#), [expert knowledge](#) and [science](#). Also, several words and phrases – particularly [sustainable](#) and [green](#) – are occasionally presented as buzzwords, with scepticism relating to the empty way that they are sometimes used.

5. **Attitudes towards conservation groups:** On the whole, conservation groups are presented in a positive light, and are often cited as sources of authority, lending weight to statements about the environment. There are a few cases, however, where there are negative perceptions of particular groups or projects being mismanaged or being out of touch with local needs. See [conservation group](#), [volunteer](#) and [National Trust](#).

6. **Nature as a commodity:** In the government corpus in particular, a recurrent theme is the concept of nature as an asset, with wildlife and landscape considered in terms of their economic value to humans. This concept is occasionally questioned, with arguments that it is impossible to place a value on nature. See [ecosystem services](#), [nature](#), [heritage](#), [value](#), [culture](#) and [green space](#).

7. **Relationship between humans and nature:** One issue that emerges from the data is the question of whether nature is separate from humans, or whether humans are part of nature (see [nature](#), [natural](#), [biosphere](#) and [biodiversity](#)). Related to this is public concern over the designation of particular areas for conservation, and the argument that this should be extended to all areas (see e.g. [national park](#)).

8. **Wild and cultivated land:** There are mixed attitudes towards wilderness: while it is sometimes presented as negative, overgrown and abandoned, there are also positive references to land which is untouched by humans. See [allotment](#), [beauty](#), [vegetation](#) and [wilderness](#).

9. **Fear and open spaces:** Although attitudes towards the countryside and green spaces are generally positive, there are also indications of fear associated with isolated areas. See [fear and anxiety](#), [green space](#), [open space](#) and [urban park](#).

10. **Human effect on the environment:** Despite the very frequent references to the harming of the environment, ecosystems, habitats etc., closer inspection revealed that there was often avoidance of reference to who was responsible for this. There was a tendency – even in the language of environmentalists – to use language which avoided reference to agency, e.g. ‘ecosystems are being degraded’ rather than ‘people are degrading ecosystems’. See [ecosystem](#), [habitat](#) and [pollute](#). See also [section 2](#) above for references to other literature about avoidance of agency in language about the environment.

Section 5. Detailed findings

Group 1. Ecosystems

****Ecosystem***

UKWaC: Key collocates include adjectives and nouns which indicate location (*marine, aquatic, forest*); adjectives which indicate vulnerability (*fragile, threatened, endangered, delicate*); verbs indicating harm done to ecosystems (*degrade, disrupt, damage, harm, threaten, upset, suffer*); and verbs referring to the protection and regeneration of ecosystems (*conserve, preserve, protect*). The most salient verb collocate of *ecosystem* is *degrade*, but most of the sentences in which this occurs do not show who does the degrading. Over 90% use either a passive form (e.g. *ecosystems are degraded*) or the phrase *degraded ecosystems*, thus avoiding reference to the people or activities that degrade them. The positive verb *protect* is more frequently found with an agent: NGOs, governments, humankind in general and occasionally plants and animals are presented as *protecting ecosystems*. However, about half of the sentences with *protect* present the protection of ecosystems is a goal rather than something that has already been achieved: for example, we *must protect ecosystems*, and measures are *designed to protect* them. Of a random sample of 100 citations with *ecosystem*, most were objective descriptions, or comments on the importance of ecosystems or their protection. Two were figurative uses, e.g.

‘...companies forget that CRM is more than a single application – it is an integral part of their overall business ecosystem and needs to be intragrated [sic] into the enterprise.’
(knowledgestorm.com)

Comparison with other words in UKWaC: The word which is used most similarly to *ecosystem* in UKWaC is *habitat*. Both are modified by words such as *aquatic, coastal, fragile* and *diverse*. However, ecosystems are more likely to be described as *delicate*, while habitats are more often described as *valuable* and *rare*. Furthermore, while both habitats and ecosystems are referred to as *degraded*, there are significantly more references to *destroying* habitats, as well as to *protecting, safeguarding* and *enhancing* them.

Ecosystem is also used in similar patterns to *flora, biodiversity* and *ecology*.

Main differences in specialised corpora: *Ecosystem* is more than twice as frequent in the academic corpus as in the other two corpora. Key phrases in all three include *ecosystem approach* and *ecosystem services* (discussed below) as well as *ecosystem function* and *functioning ecosystem*. A notable difference in the government corpus is the phrase *ecosystem goods and services*, emphasising their economic value, e.g. in ‘Work in partnership with the other EU countries and other governments worldwide to develop market based mechanisms for valuing and trading ecosystem goods and services’ (scotland.gov.uk).

Ecosystem approach

UKWaC: In a random sample of 100 citations, eight were in inverted commas – e.g. ‘An “ecosystem approach” involves everybody; you can not just impose it.’ (jncc.gov.uk) – indicating that the phrase is not yet fully integrated into the language. Most of the citations were from government or academic websites referring to policy decisions. All citations were either neutral descriptions of the concept, or positive endorsements, e.g.

‘An ecosystem approach makes complete sense. It is only through an integrated, whole system process that all levels of the natural world etc. can be catered for.’ (defra.gov.uk)

Main differences in specialised corpora: In all the corpora, *ecosystem approach* is presented as a positive, necessary concept. It is almost three times as frequent in the academic and government corpora as in the public corpus.

Ecosystem services

UKWaC: In a random sample of 100 citations, many were from academic websites, with frequent references to ‘ecosystem services and natural capital’, the *loss* and *degradation* of ecosystem services, and the *provision* and *benefits* of ecosystem services. The ‘services’ mentioned include drinking water and food, and in some cases are explicitly measured in monetary terms, e.g.

‘Within the project area, ecosystem services may be c. \$1.5 billion y⁻¹, or \$105 person⁻¹ y⁻¹.’ (warwick.ac.uk)

In some cases, other social services are considered as well:

‘...the loss of biodiversity and related ecosystem services has resulted in several socio-economic costs, including financial losses.’ (ieep.org.uk)

There is also one quotation which indicates that such financial measurements are misleading:

‘...any numerical value placed on the ecosystem services delivered by biodiversity “is a serious underestimate of infinity” (Toman 2000).’ (nbu.ac.uk)

Main differences in specialised corpora: *Ecosystem services* is almost three times as frequent in the academic corpus as in the other two corpora. A random sample of 50 in the academic corpus showed that most references were to *classifying*, *quantifying* and *defining* ecosystem services, as well as to their *provision* and *management*.

Biosphere

UKWaC: The most salient collocate of *biosphere* is *reserve*. Other phrases include *harm/destroy the biosphere*, *biosphere dome* and *terrestrial biosphere*. Of a random sample of 100 citations, 21 were the phrase *biosphere reserve*, and other citations referred to the complexity, processes and workings of the biosphere. Most were from academic websites.

Main differences in specialised corpora: *Biosphere* is most frequent in the academic corpus, and rare in the government corpus. In the public corpus, most of the citations are references to *biosphere reserves*, and some to *urban biospheres*, focusing on the relationship between humans and nature:

‘Unesco’s advisers said the criteria were likely to demand that ecology interweave seamlessly with urban life ... “These places will not be pristine biospheres like the Amazon, but in many of our cities there are areas of biodiversity and it’s about identifying them and making sure they are given elevated status and thoughtfully managed.”’ (guardian.co.uk)

The contrast of urban reserves and ‘pristine biospheres like the Amazon’ underlines the frequent perception of nature as separate from humans, and challenges this notion by suggesting that ecology ‘interweave seamlessly with urban life’. However, another citation refers to the independence of the biosphere:

‘The biosphere will continue whetehr [sic] or not mankind’s civilisation survives.’ (guardian.co.uk; reader’s comment)

Biome

UKWaC: *Biome* is infrequent in UKWaC (fewer than 0.01 per 10,000 words). Of a random sample of 100 citations, 18 referred to the enclosures which emulate biomes in the Eden Project in Cornwall, and there were also references to other greenhouses as ‘biomes’. Other citations were factual references to types of biomes such as *tropical biomes* and *arctic biomes*.

Main differences in specialised corpora: *Biome* is approximately five times as frequent in the academic corpus as in the other two corpora, and collocates with *cool* and *mixed*, *shrubland* and *forest*. In the public corpus, almost half of the citations refer to the Eden Project.

Group 2. Environment and ecology

***Environment, environmental and environmentally**

UKWaC: Key phrases with *environment* include *protect the environment*, *create an environment*, *built environment*, *historic/natural/marine/safe environment* and *learning/working/computing environment*. Of a random sample of 100 citations, most were of the sense ‘place where people live/work’, e.g. ‘a safe environment’, or the sense ‘conditions’, e.g. ‘a competitive retail environment’. Two were the phrase *the built environment*, and 17 were *the environment*, mainly in the sense ‘the natural world’. Several referred to *polluting*, *damaging* and ‘devastating impacts on’ the environment, and several to *cleaning*, *preserving* and *protecting* the environment. *Environmental* modifies *impact*, *degradation*, *protection* and *sustainability*, and also collocates with *social* and *economic*. Of a sample of 100 with *environmentally*, almost half collocate with *friendly*; other collocates are *sound*, *responsible* and *sensitive*. The promotional use of *environmentally friendly* is evident, e.g.

‘Switch to Ecotricity Support CARE and be environmentally friendly at no extra cost by switching your home electricity supply.’ (careinternational.org.uk)

Comparison with other words in UKWaC: The word which is used most similarly to *environment* in UKWaC is *resource*; both collocate strongly with, for example, *natural*, *the earth’s* and *the planet’s*. (They are also similar because of their use in relation to learning and information, with similar collocates including, e.g. *Internet* and *educational*.) *Environment* collocates more strongly with verbs referring to creation and improvement: *protect*, *create*, *build*, *enhance* and *improve*. *Resource*, on the other hand, collocates more strongly with verbs referring to use: *utilise*, *use*, *share* and *exploit*.

The word which is used most similarly to *environmental* is *social*, both collocating with *science*, *issue*, *factor*, *responsibility* and *change*. However, *social* collocates more strongly with *economic*, *cultural* and *political*, while *environmental* collocates more strongly with *degradation*, *protection*, *sustainability* and *improvement*.

Main differences in specialised corpora: In all three corpora, the most salient verb collocate of *environment* is *protect*, while in the government and public corpora other collocates are *enhance* and *improve*. *Environmental* is particularly frequent in the academic corpus (about twice as frequent as in the other two corpora), collocating strongly with *change*, *issue* and *problem*. In the government and public corpora, on the other hand, the key phrase is *environmental impact*. In both the academic and public corpora, the most frequent phrase with *environmentally* is *environmentally sustainable*, whereas in the government corpus it is *environmentally sensitive area*. *Environmentally friendly* and *environmentally problematic* are also frequent in the public corpus.

Ecology and ecological

UKWaC: Key phrases are *microbial ecology*, *behavioural ecology*, *biology and ecology*, *freshwater ecology* and *plankton ecology*. A random sample of 100 citations included examples both of the sense ‘the relationship between organisms and their environment’, e.g. in ‘fish ecology’ and ‘the foraging ecology of hen harriers’ and the sense ‘the study of this relationship’ as in ‘scientific disciplines such as climatology and ecology’. Many were in book, course or thesis titles, indicating the primarily academic nature of the word. There were also instances of the extended sense of *ecology* to refer to any interrelationship, e.g. *political ecology*, *information ecology* and *ecology of learning*. *Ecological* is used in a more emotive way than *ecology*, collocating with *footprint*, *catastrophe* and *disaster*, and, in a random sample of 100 citations, is often used synonymously with ‘environmentally friendly’, e.g.

‘For two years she was a tenant in Bridge- 5 Mill, running a small ecological interior design company “The Wholespace” specialising in eco-paints and textiles...’ (merci.org.uk)

‘However, Ecover’s ecological principles extend far beyond the natural ingredients used and the products they create.’ (observer.guardian.co.uk)

Main differences in specialised corpora: *Ecology* is almost six times more frequent in the academic corpus than in the government corpus, and more than eight times more frequent in the academic than

in the public corpus. There are also interesting differences in the ways that *ecological* is used: in the academic corpus the collocates are primarily scientific, e.g. *knowledge*, *economics* and *process*; in the government corpus the key phrase is the *ecological character* of an area; while in the public corpus there is more concern over *ecological footprints* and *good ecological status*.

Eco-

UKWaC: The most frequent words with *eco-* are *eco-friendly*, *eco-tourism*, *eco-design*, *eco-congregation*, *eco-school*, *eco-efficiency* and *eco-warrior*. All citations in a random sample of 100 were positive, and some indicated the promotional use of the prefix *eco-*:

‘Barratt has unveiled a unique “eco-village” of new homes packed with the latest in energy-efficient and “green” technologies.’ (barratt-investor-relations.co.uk)

‘ECO ONE Distributes the Eco-One spa water conditioner containing natural enzymes, minerals and plant extracts.’ (homesources.co.uk)

Main differences in specialised corpora: The most frequent words with *eco-* in the academic corpus are *eco-charge*, *eco-friendly*, *eco-production*, *eco-tourism* and *eco-tax*; in the government corpus the most frequent is *eco-school*; and in the public corpus the most frequent are *eco-towns* and *eco-tourism*. The prefix *eco-* is almost seven times more frequent in both the academic and public corpora than in the government corpus, although most of the citations in the public corpus are from one RSPB document on *eco-towns*. The citations in all three are generally neutral or positive, although in the public corpus blogs there are a few negative or disparaging uses of the prefix:

‘Much of the evidence for declining biological diversity comes from eco-extremist groups, so can not be trusted.’ (bbc.co.uk/blogs)

‘You eco-heads hold the world back by imposing ridiculous “limits” on new technology.’ (greenpeace.co.uk/blog; reader’s comment)

Group 3. Habitats

****Habitat***

UKWaC: Key collocates include nouns relating to destruction (*habitat fragmentation*, *habitat destruction* and *habitat loss*) and, less frequently, nouns relating to rebuilding (*habitat restoration* and *habitat creation*). The most salient verb of which *habitat* is an object is *conserve*. *Conserving habitats* is usually presented as a goal: for example, there is *a need to conserve habitats* and *plans for conserving habitats*. The most salient negative verb collocate is *degrade*, and 90% of sentences in which this occurs contain a phrase with no agent, such as *degraded habitat* and *habitats are degraded*. Only five give an agent or cause of the degradation: pollution, road-building (twice), loss of bank-side vegetation and agricultural intensification. In a random sample of 100 citations with *habitat*, there were neutral references to the analysis and monitoring of habitats, references to habitat loss and degradation, and positive references to the importance of habitats, particularly in terms of variety and diversity, e.g.

‘This reserve remains an important area of conservation with a variety of habitats including ancient woodland, scrub, marshy grassland, fen/Carr, and magnesian limestone grassland...’ (sedgfield.gov.uk)

Comparison with other words in UKWaC: The word that is used most similarly to *habitat* is *vegetation*. Both occur with modifiers indicating type and location, e.g. *aquatic*, *riparian*, *terrestrial*, *heathland* and *savannah*. *Vegetation*, however, collocates more strongly with *lush*, *dense* and *decaying*. *Habitat* collocates more strongly with words referring to creation and protection: *destroy*, *restore*, *protect*, *preserve*, *manage* and *maintain*. Also, only *habitat* is modified by *valuable*, *fragile* and *rare*: there are no citations referring to *valuable/fragile/rare vegetation*.

Habitat also occurs in similar patterns to *woodland*, *species* and *forest*.

Main differences in specialised corpora: *Habitat* is almost twice as frequent in the government corpus as in the public and academic corpora. In both the government and public corpora, a salient phrase is

important habitat, and in the government corpus *valuable habitat* is also key, for example ‘England’s forests are a valuable habitat and species resource’ (forestry.gov.uk). Neither of these is salient in the academic corpus or in UKWaC. There are also differences in verb collocates: in the government corpus the most salient are *create* and *identify*; in the academic corpus, *protect* is the main collocate; and in the public corpus, the most salient are *restore*, *create* and *provide*.

Biotope

UKWaC: Salient phrases include *subtidal/sublittoral biotopes* and *biotope classification/mapping/complex*. *Biotope* is infrequent in UKWaC (fewer than 0.01 occurrences per 10,000 words), and a random sample of 100 citations showed that it is generally used in scientific and academic language, frequently with reference to mapping, classifying and recording biotopes.

Main differences in specialised corpora: *Biotope* is approximately six times as frequent in the academic corpus as in the public and government corpora. Recurrent phrases in the academic corpus are *biotope maps/mapping* and *biotope classification*.

Group 4. Nature and humans

Nature

UKWaC: Salient collocates indicate that the main sense of *nature* used in UKWaC is ‘the basic qualities or features of something’: key phrases are *understand the nature of...*, *reflect the nature of...*, *the changing nature of...*, *the very nature of...*, *the nature of relationships/reality/problems*, *human nature* and *true nature*. Where *nature* modifies another noun it is usually the other sense of *nature* that is used – ‘the physical world and living things’ – for example in *nature reserve*, *nature conservation*, *nature trail* and *nature lover*. Of a random sample of 100 citations, 72 were of the ‘basic qualities’ sense, and 28 of the ‘physical world’ sense. Of the latter, there are several references to *nature conservation* and to *English Nature*. There are also several which indicate the separation of humans from the rest of nature, e.g.

‘The senryu is similar in form to the haiku but concerns itself with the human condition rather than nature.’ (geraldengland.co.uk)

‘Severe earthquakes and volcanic eruptions will also belong to that time, and these will cause much suffering and misery and deaths besides enormous destruction and devastation, as all of nature and the planet itself will rise up against the insanity of human beings on Earth.’ (crawford2000.co.uk)

Main differences in specialised corpora: *Nature* is about twice as frequent in the government corpus as in the other two specialised corpora. In all three, key phrases are *nature conservation* and *nature reserve*, while in the government corpus *nature interest* and *nature value* are also salient, for example:

‘There is potential to enhance the nature conservation value of the site to increase species and structural diversity of selected habitat areas.’ (highpeak.gov.uk)

In the academic corpus, salient verbs refer to processes of analysing and protecting nature – *conserve*, *explain*, *understand*, *explore* – whereas in the government and public corpora there are also key verbs relating to human interaction with nature – *experience* and *enjoy* – for example:

‘If you experience wildlife first-hand, you’re more likely to love it, and if you love it, you’ll protect it. Sign our letter and encourage politicians to create more opportunities for young people to enjoy nature.’ (rspb.org.uk)

Natural

UKWaC: Salient words which *natural* modifies are *beauty*, *disaster*, *habitat*, *resource*, *selection* and *environment*. *Natural* also collocates with *outstanding* (almost always in the phrase ‘area of outstanding natural beauty’) and with *man-made*, *artificial*, *synthetic* and *organic*. A random sample of 100 citations showed the various senses of *natural*: ‘not man-made’, e.g. ‘Natural alternatives are not only much safer than using prescription drugs but also a lot cheaper’ (gpenterprises.co.uk); ‘occurring in nature’, e.g. ‘The natural setting of the mighty Sognefjord and its surrounding area has

something for everyone' (fjordline.co.uk); 'reasonable, obvious', e.g. 'PensionsOffice Professional is the natural first choice for pensions managers' (edis.co.uk); and 'genuine, not false', e.g. 'We eventually saw her Juliet – a dramatic and beautifully natural affair'. These citations indicate the way that the natural world is perceived as genuine and beautiful in contrast with that which is man-made or artificial, and that this positive connotation carries over to the figurative uses of *natural*. However, one citation questions the distinction between the natural and the man-made:

'... we have been forced to acknowledge that humans are only one species amid millions on the globe and have begun to want the sound-world we humans inhabit to reflect an integrated view of our environment, not one separated into the natural and the artificial.' (msteer.co.uk)

Main differences in specialised corpora: In all three corpora, the most salient collocates are *environment* and *resource*. There are a few collocates which are particular to the academic corpus and less salient in the public and government corpora: *management*, in the phrase 'natural resource management', *anthropogenic*, e.g. in 'natural and anthropogenic pressures' and *hazard*, e.g. 'drought and other natural hazards'.

Semi-natural

UKWaC: Salient noun collocates include *woodland*, *habitat*, *grassland*, *vegetation* and *ecosystem*, while adjective collocates include *broad-leaved* and *ancient*, almost always with reference to woodland. A random sample of 100 citations consisted mostly of neutral descriptions or classifications, with some positive references to the use or importance of semi-natural areas, e.g.

'Controlled, managed communities such as parks and gardens are straightforward to maintain, but expensive in resources, and forsake the chance of the unexpected which make semi-natural habitats interesting.' (btcv.org.uk)

Main differences in specialised corpora: *Semi-natural* is particularly frequent in the government corpus, over six times more frequent than in the academic corpus. Collocates are similar in all three: *woodland*, *vegetation* and *habitat*.

Man-made

UKWaC: *Man-made* modifies *fibre*, *mound*, *chemical*, *disaster*, *lake* and *global warming*; it also collocates with *natural* and *hazardous*. Of a sample of 100 citations, there were several neutral descriptions of features of the landscape, such as

'The man-made lake is rich in fish and other forms of sea life.' (casi.org.uk)

There were also nine references to man-made climate change/global warming/gases/emissions, and a few to man-made pesticides and chemicals, e.g.

'Man-made pesticides blamed for fall in male fertility over past 50 years.' (library.nhs.uk)

While these are mainly critical, there is one citation which questions the usual assumption that man-made is worse than natural:

'MYTH: Man-made products are more harmful than organic products. FACT: The origin of a chemical does not have any influence on its potential toxicity, and many natural toxins are far more lethal than those used in garden products.' (gardencareproducts.org.uk)

The website from which this citation was taken promotes the use of chemicals in garden care.

Main differences in specialised corpora: *Man-made* is about five times more frequent in the public corpus than in the government corpus, and three times more frequent than in the academic corpus. In particular, references to man-made global warming/climate change are over ten times more frequent in the public corpus than in the other two, often discussing the question of whether there are in fact man-made causes, e.g.

'The fact is that any rational person must acknowledge the consensus of man-made climate change.' (bbc.co.uk)

Group 5. Climate and pollution

Climate

UKWaC: By far the strongest collocate of *climate* in UKWaC is the noun *change*; indeed, over 40% of the citations with *climate* are of the phrase *climate change*. Other noun collocates include *variability*, *prediction*, *chaos* and *model*, while adjective collocates include *temperate*, *mild*, *tropical*, *warm* and *humid*. Of a random sample of 100, 42 were of the phrase *climate change*, which is analysed below; there were also a few instances of *climate shift*, *climate model* and *climate reconstructions*. Eighteen citations were of the metaphorical sense ‘general feeling or situation’, for example *political climate*, *economic climate*, *climate of fear*, *climate of terrorism* and *climate of anti-intellectualism*. It is notable that all of these citations refer to negative situations or feelings; even the phrase *economic climate* generally refers to an unfavourable economic situation. The remaining citations were neutral references to particular weather conditions, e.g. ‘the island has a sunny climate’.

Main differences in specialised corpora: In all three corpora, *change* is the strongest collocate, and is analysed below.

Climate change and global warming

UKWaC: Frequent phrases with *climate change* in UKWaC include (in order of frequency) *tackle/tackling climate change*, *climate change levy*, *climate change impacts*, *climate change issues* and *human-induced climate change*. *Climate change* is approximately three times more frequent than *global warming*. A random sample of 100 citations of each phrase showed the varied attitudes and beliefs about climate change and global warming in the public sphere, ranging from concern to scepticism to outright denial. In some cases, beliefs and facts are weighed objectively, e.g.

‘Many people believe climate change is irrevocably changing Britain’s weather, but scientists are divided.’ (money.independent.co.uk)

‘While global warming is far from “crank science”, as the critics of Kyoto have called it, it is not the science any practising politician is likely to remember from high school, or voters readily comprehend.’ (lrb.co.uk)

In other cases, the human causes are denied, e.g.

‘The conclusion to be drawn from this is that current inter-governmental policies for ‘controlling’ climate are risible King Canute strategies, not only because climate change on much longer timescales than centuries is also observed... but also because carbon dioxide is not a major climate forcing as claimed.’ (abd.org.uk, Association for British Drivers)

It is notable that this argument is presented objectively (with factual verbs such as ‘is not’ rather than modals such as ‘might not’), even though it clearly presents a particular point of view from an interested group. Other citations are emotive, e.g.

‘...London has more to fear than many other places from global warming.’ (jeanlambertmep.org.uk)

Main differences in specialised corpora: Key phrases with *climate change* in all three corpora are *climate change adaptation* and *climate change mitigation*, while *tackle climate change* is frequent in the public corpus but less so in the government and academic corpora. Of random samples of 50 in each corpus, most citations presented climate change as a problem, with references to how to stop it, reduce it, or understand its effects. However, a few referred to perceived positive outcomes:

‘Climate change is likely to have some mixed effects, such as the expansion and contraction of the range of malaria in different regions. In some places, climate change is likely to bring some benefits to health such as fewer deaths from cold exposure.’ (bbc.co.uk)

‘Climate change may offer new opportunities for the collections. After the 1987 storm the Royal Botanic Gardens, Kew extended their tree collection to include more species better suited to increasing temperatures.’ (nationaltrust.org.uk)

There was only one case of denial of the human causes of climate change:

‘Climate change is a natural phenomenon and is not man made, left wingers should stop lying and stop saying it is.’ (bbc.co.uk; reader’s comment on article)

Climate change is much more frequent than *global warming*: seven times more frequent in the public corpus, nine times more frequent in the academic corpus, and 20 times more frequent in the government corpus. *Global warming* is most frequent in the public corpus, where the usages are typically negative and often highly emotive, although there is clear evidence of incredulity concerning scientific claims:

“What a pity then that the nonsense about CO₂ causing global warming had to be brought into it. I fear that some of the good work which environmentalists do and real potential catastrophes which they warn about will be discredited [sic] when the global warming scam is finally exposed.” (news.bbc.co.uk)

Greenhouse effect

UKWaC: A random sample of 100 citations showed mixed use of the term *greenhouse effect*. In some cases, the *greenhouse effect* is presented as an environmental problem in itself, a synonym of *global warming*:

‘The stability of our planet’s life support system is under threat from ozone depletion, the greenhouse effect, deforestation and toxic and radioactive wastes.’ (keele.ac.uk)

In others, it is presented as a natural phenomenon:

‘Life on Earth exists because of the natural greenhouse effect. This keeps just enough heat in the atmosphere for species to survive on the world’s surface.’ (thenewspaper.org.uk)

In several citations, a distinction is made between the *natural greenhouse effect*, which is necessary for life, and an *enhanced/human-induced/runaway greenhouse effect*.

Main differences in specialised corpora: In both the academic and public corpora, there are references to *enhancing*, *contributing to*, *increasing* and *exaggerating* the greenhouse effect. The term is infrequent in the government corpus.

****Pollution and pollute***

UKWaC: *Pollution* is most closely associated with air and traffic: *air* is the most salient noun modifier, and *congestion* the most salient conjoined noun (in phrases such as *pollution and congestion*). Other key phrases are *noise pollution*, *water pollution*, *diffuse pollution* and *atmospheric pollution*. The most salient verb of which *pollution* is the object is *reduce*, and the phrase *reduce pollution* is over three times more frequent than *prevent pollution*. Many sentences with *reduce pollution* are about the pollution caused by vehicles, with references to, for example, using a bike, or cutting a vehicle’s engine while stopped. Some refer to other measures for reducing pollution, such as using renewable energy and reducing pesticide use, and some are about non-specific goals or measures, for example ‘The government has set national targets to reduce pollution’. *Pollution* also appears as the subject of sentences, and its most salient verb collocates are *aggravate* (especially in contexts relating to allergies and illnesses, e.g. ‘air pollution aggravates the symptoms of asthmatics’) and *contaminate* (‘pollution contaminates the air’). A random sample of 100 citations included a mixture of factual statements, and more emotive statements such as:

‘The car is charged with: “causing a persistent menace to society over the last 100 years and with having caused, aided or abetted the: loss of over 450,000 lives; belching of toxic cocktails of lethal pollution; increased suffering of people, particularly children, with asthma and other serious health problems; wilful destruction of thousands of acres of beautiful British countryside...”’ (foe.co.uk)

When the verb form *pollute* is used, human agents of pollution are rarely given. The most salient subjects of *pollute* are all inanimate: *fumes*, *chemicals*, *factories*, *waste*, *emissions*, *vehicles*, *fuel* and *farms*. This can be seen even in the language of environmentalists: one writes that

‘Cars pollute, walkers and cyclists do not.’ (bwpics.co.uk)

The choice of *cars* here, rather than *drivers* (which would more evenly parallel *walkers* and *cyclists*), indicates the extent to which the avoidance of human agency pervades – perhaps unconsciously – the language of environmental problems.

Comparison with other words in UKWaC: The word that is used most similarly to *pollution* is *emission*, both collocating with words such as *exhaust*, *noise*, *global warming*, *traffic*, *smoke*, *particle*, *reduce* and *emit*. There are more references, however, to *cutting*, *offsetting*, *lowering* and *regulating emissions* (rather than *pollution*), and the phrases *greenhouse gas/carbon dioxide emissions* are more frequent than *greenhouse gas/carbon dioxide pollution*. On the other hand, there are significantly more references to *preventing* as well as to *causing pollution*, and to the way that people are *affected* by pollution.

Pollution also occurs in similar patterns to *contamination*, *pollutant* and *congestion*.

Main differences in specialised corpora: While the most salient verb collocate in the government corpus is *tackle*, the most salient in the public corpus is *reduce*, usually with reference to general aims and targets, but occasionally with more specific figures, e.g.

‘To have a level playing field, the US *MUST* first reduce their pollution by at least 75% before any of its citizens can point a finger at any other country!!’ (bbc.co.uk)

In all three, *air pollution* is frequent, and in the academic corpus *atmospheric* is a salient collocate. *Light pollution* is also key in the government and public corpora (but not in the academic corpus), with references to effects on animals and humans:

‘Light pollution could affect breeding success and susceptibility to predators.’
(shipway.gov.uk)

‘Light pollution is not just a waste of money... badly designed lighting is also having an impact on the environment and our health, as well as denying millions of people the right to enjoy the beauty of the night sky.’ (bbc.co.uk)

Pollute as a verb is much less frequent than *pollution* in all three corpora, and is frequently used in phrases referring to people or things which pollute, such as *polluting countries*, *polluting industries* and *polluting practices*.

Group 6. Conservation, development and management

Conservation and conserve

UKWaC: Key phrases include *further/promote conservation*, *conservation designation*, *conservation area*, *conservation biodiversity*, *wildlife conservation* and *nature conservation*. The most salient reference to a particular animal is *red squirrel conservation*. A key phrase with *conserve* is *conserve and enhance*; others are *conserve biodiversity*, *conserve wildlife*, *conserve habitats* and *conserve energy* (both in senses related to the environment – ‘If finding new sources of clean energy is one part of the equation, conserving the energy we use is the other’ – and in unrelated senses – ‘Work part-time... Conserve your energy for the important events in your life’). Of a random sample of 100 citations with *conserve* and 100 with *conservation*, almost all were positive or neutral; only two referred to problems with conservation projects:

‘Most conservation initiatives have been unrealistic from the standpoints of local communities.’
(cru.uea.ac.uk)

‘...the Working Group observed that conservation projects are an essential tool in facilitating conservation activities, but frequently are constrained in their effectiveness by being too short term and too weakly linked to policy development.’ (forestforum.org.uk)

Main differences in specialised corpora: The most salient verb collocate of *conservation* in the academic corpus is *integrate*, for example in ‘integrate conservation and development’, compared to *promote* and *further* in the other corpora. A key phrase in the government corpus is *conservation concern*, usually in the phrase ‘species/bird/habitat etc. of conservation concern’: this phrase is approximately eight times more frequent in the government corpus than in either the public or academic corpus. *Conserve and enhance* is a key phrase in all the corpora, but the government corpus also uses *conserve and protect*, whereas in the academic and public corpora *conserve and restore* is more salient. Each corpus has *conserve biodiversity* as a key phrase, and *conserve beauty* is also salient, e.g. in ‘conserve the natural beauty of the countryside’.

Conservation group

UKWaC: Of a random sample of 100 citations in UKWaC, many were neutral references to specific groups, e.g. ‘the conservation group British Trust Conservation Volunteers’. There are also positive references to what conservation groups achieve or aim to achieve, especially in co-operation with other groups, e.g.

‘a coalition of voluntary conservation groups who have come together to restore stocks of wild Atlantic salmon to their historic abundance.’ (carmarthenshire.org.uk)

There are a few references to conservation groups protesting against developments and raising objections to plans, but only one of the 100 citations could be interpreted as negative:

‘...it has been known for conservation groups to cause delays to such developments.’ (castlechurch.org.uk, referring to plans for church building extension)

Another citation refers to a negative perception of conservation groups, but frames this within a reference to the ‘absurdity’ of such opinions:

‘The “St Kitts and Nevis Declaration” states that the current ban on commercial whaling is unnecessary, that whales are out-competing humans for fish and that conservation groups are a threat to governments. The pro-whaling members of the IWC have just won a vote in favour of this absurd declaration – by a majority of one.’ (dailyinfo.co.uk)

Main differences in specialised corpora: *Conservation group* occurs approximately twice as often in the public corpus as in the academic or government corpus. In the public corpus, it is often used in news articles to report the views of such groups as a way of citing authority on environmental issues, e.g.

‘Conservation groups are so alarmed, they are warning that some birds... are facing extinction on the moor.’ (bbc.co.uk)

In the academic and government corpora, on the other hand, most of the occurrences are factual references to the existence of such groups. In all the corpora, conservation groups are presented as working with other groups, e.g.

‘...conservation groups in partnership with government.’ (guardian.co.uk)

‘...consultation with conservation groups, amenity groups, councils...’ (soton.ac.uk)

RSPB

UKWaC: A random sample of 100 citations with *RSPB* showed that it is used in a mixture of neutral statements of fact (e.g. that a particular person works for the RSPB, or that something is located near an RSPB reserve) and positive statements where it is represented as an authority and a source of expertise, advice and knowledge:

‘The RSPB can advise on feeding garden birds.’ (reigate-banstead.gov.uk)

‘...RSPB approved binoculars...’ (capewrathtrail.co.uk, an online shop)

‘...a recent report by the RSPB revealed that...’ (greentourism.org.uk)

Main differences in specialised corpora: *RSPB* is, not surprisingly, very frequent in the public corpus, which includes the RSPB’s own website. The RSPB website presents its positive aims and achievements; it ‘speaks out for birds and wildlife’, has a ‘vision of sustainable farming’, ‘has considerable experience’ and so on. In the government corpus there are more citations where the RSPB is presented as opposing plans (for example to airport extensions), lodging objections and expressing concerns. References to the RSPB in the academic corpus are almost all in the form of citations of RSPB publications or statements about academics’ affiliations.

Wildlife Trust

UKWaC: Of a random sample of 100 citations, all were either neutral or positive, with references to Wildlife Trusts supporting initiatives and carrying out research. There were several references to ‘the Wildlife Trusts’ collectively, and to partnerships with other organisations, e.g.

‘The Wildlife Trusts have recently joined a coalition of development and environmental organisations, and union, faith, community and women’s groups, who are pledging to “Stop Climate Chaos”.’ (bbowt.org.uk)

Main differences in specialised corpora: There are more than five times as many references to Wildlife Trusts in the government corpus than in either the public or academic corpus. Citations were all neutral or positive.

National Trust

UKWaC: Of a random sample of 100, most citations were neutral, with frequent references to the National Trust owning, buying or managing land, and to National Trust membership. However, two citations indicated negative public perceptions of the organisation:

‘Not for the first time, the National Trust is completely out of touch with public opinion on this issue.’ (10000things.org.uk, on the issue of selling land to road builders)

‘The National Trust is planning to sell hundreds of acres of land near historic buildings to private developers, amid accusations that it has tried to bully local people into dropping their objections to the sell-off.’ (greenconstruction.co.uk)

Main differences in specialised corpora: *National Trust* is particularly frequent in the public corpus, which includes its website where it presents its vision and commitments in a positive light. References in the academic and government corpora are neutral or positive.

Heritage

UKWaC: Key phrases include *preserve/conservesafeguard heritage, cultural heritage, rich heritage, the nation’s heritage, heritage trail* and *heritage attraction*. A random sample of 100 showed the very positive connotations of the word, often as a selling point in tourist websites, e.g.

‘Visit the Dean Heritage Centre to discover more about the Forest’s fascinating history and heritage.’ (visitforestofdean.co.uk)

Main differences in specialised corpora: A strong collocate of *heritage* in the government corpus is *asset*, highlighting the economic importance of UK culture. Indeed, there is recognition of the potentially problematic nature of this association:

‘Changing of the wording of objective 7 which previously read “Exploit heritage aspects of Torbay’s green spaces” to remove the term “exploit” and replace with “Promoting and protecting heritage assets of Torbay’s green space”.’ (torbay.gov.uk)

‘Ensure that tourism opportunities are maximised in development of heritage assets providing at all times that heritage significance is not compromised.’ (southwest-ra.gov.uk)

National park

UKWaC: Of a sample of 100, all citations were neutral or positive, with frequent references to the beauty of national parks, as well as their functions, e.g. ‘Today, the Northumberland National Park acts as a welcome ‘lung’ for Tyneside’s cyclists’ (danorth.fsnet.co.uk).

Main differences in specialised corpora: Samples of 50 citations each from the academic and government corpora were all neutral or positive. However, the public corpus contained three citations of a sample of 50 – two from *The Guardian* and one from the *BBC* – which discussed problems with the idea of national parks. These are worth quoting fully, as they indicate some public concerns about the notion of conservation being confined to designated areas, and about the function of national parks:

‘Do we want nature to be confined in zoos and botanic gardens or isolated pockets where rich tourists could go and watch what once covered most of our planet? Global changes and new

emerging threats will not allow us to maintain this static model. Climate change, invasive species and diseases do not stop at the borders of national parks.’ (bbc.co.uk)

‘Traditional site-based conservation may be on the way out. With climate change upon us, species that find themselves marooned on small patches of wild land, says Doughty, may be doomed. He does not go quite so far as agreeing with Bill Bryson that England should be one big national park . But a radical shake-up of England’s conservation policy is on the cards.’ (guardian.co.uk)

‘As agriculture becomes unsustainable in parts of Europe and shifts to the north and west, government may have to reappraise its priorities and ask what it wants from national parks.’ (guardian.co.uk)

Reserve

UKWaC: The noun *reserve* has two main senses: ‘area of protected land’ and ‘supply of materials’. The reasonably high frequency of the ‘area of protected land’ sense in UKWaC is indicated by the strong collocate *nature*: the phrase *nature reserve* accounts for about 10% of the occurrences of *reserve*. *Biosphere reserve* is less frequent but very salient. The ‘supply of materials’ sense is also frequent, indicated by the strong verb collocates *deplete* and *dwindle*, and also the noun collocates *oil*, *gas* and *coal*. A sample of 100 citations with *nature reserve* was analysed (*nature reserve* rather than *reserve* was sampled so as to get a higher proportion of the relevant sense), and all citations were positive or neutral. Thirteen referred to *local nature reserves*; and several mentioned the protection that reserves offer. *Biosphere reserves* are also viewed in a positive light, although one citation refers to potential problems: ‘In a biosphere reserve wildlife and humans cohabit - not always amicably’ (bornfree.org.uk).

Main differences in specialised corpora: In the academic corpus, the strongest collocate is *marine*; *marine reserve* is almost twice as frequent as *nature reserve*. In the academic corpus, references to reserves are objective and indicate the need for research, for example:

‘The use of marine reserves as fishery management tools, is still controversial and in need of objective scientific evaluation.’ (bangor.ac.uk)

In both the government and public corpora, *nature reserve* is the most frequent term, while in the government corpus *local* and *statutory* are also strong collocates.

Management

UKWaC: The key collocates of *management* in UKWaC indicate its use in business contexts, for example *senior management*, *leadership management* and *management team*. However, there are several environment-related strong collocates as well, particularly *waste management*, *resource management* and *sustainable management*. In a random sample of 100 citations, *management* was used neutrally, although there were a few cases where it was modified by an adjective such as *appropriate* or *improved*, for example ‘improved carbon management’ and ‘appropriate deer management’, indicating that management can be good/appropriate or bad/inappropriate.

Main differences in specialised corpora: In both the academic and public corpora, the most salient adjective collocate is *sustainable*, for example ‘the annual cycle of droughts and floods is prompting more sustainable water management’ (telegraph.co.uk). In the government corpus, however, the key adjective is *appropriate*, for example in proposals to ‘Encourage appropriate management of hedgerows’ (angus.gov.uk). The government corpus also uses the phrase *positive management*, for example the ‘positive management of traditional hedgerows’. This phrase is much less frequent in the other corpora (three times less frequent in the public and 13 times less frequent in the academic corpus).

Sustainable, unsustainable and sustainability

UKWaC: Key phrases with *sustainable* in UKWaC are *sustainable development*, *sustainable agriculture*, *sustainable tourism* and *environmentally sustainable*. *Unsustainable* collocates with

boom (indicating its use in financial contexts) but also with *exploitation* and *harvesting*. *Sustainability* tends to be modified by *ecological*, *environmental* and *long-term*. A sample of 100 citations with *sustainable* (the most frequent of the three terms) showed that the concept tends to be presented as an aim, as something that is developed and promoted. There is also one reference to the use of *sustainable* as a buzz-word:

‘The smugness of Official Ireland congratulating itself for last year’s record output of 50,000 new homes, without any reference to where they were built, has finally exposed claims about “sustainable development” as mere cant and hypocrisy.’ (greenconstruction.co.uk).

Main differences in specialised corpora: In all three corpora, the key phrase with *sustainable* is *sustainable development*. The phrase *sustainability appraisal* is key in the government corpus, occurring more than five times as often as in the other two corpora. Another notable difference is that *unsustainable* is almost three times as frequent in the public corpus as in the other two corpora, with references to unsustainable tourism, development and lifestyles. The strength of the word as used in the public sphere is indicated in one quotation:

‘...the emission of greenhouse gases... is simply unsustainable in the long-term. And by unsustainable, I do not mean a phenomenon causing problems of adjustment. I mean a challenge so far-reaching in its impact and irreversible in its destructive power, that it alters radically human existence.’ (guardian.co.uk)

Group 7. People and knowledge

Voluntary and volunteer

UKWaC: The key noun collocates of *voluntary* are those relating to NGOs: *sector* and *organisation*. Collocates relating to finance are also salient, in phrases such as *voluntary contribution* and *voluntary donation*. Of a random sample of 100 citations, all were neutral or positive, with references to the funding of voluntary bodies, the support that voluntary groups give, and the usefulness of voluntary work. One positive statement from the Conservative Party shows the political use of the word *voluntary* when it occurs in the context of ‘big society’ ideology:

‘We believe in a society in which there is a network of voluntary groups and charities, yes and private organisations too, helping people far more sensitively than state bureaucracies ever can.’ (tory.org.uk)

Volunteer occurs as the object of *recruit* and *train*, and also of *need* and *welcome*, indicating the perception of the usefulness of volunteers. Other strong collocates are *lifeline* and *backbone*, for example in ‘Volunteers are the lifeblood of any charity’ (hearing-dogs.co.uk). The collocates of the verb *volunteer* also indicate the positive connotations of the word: people *volunteer willingly, bravely, kindly, generously* and *enthusiastically*.

Main differences in specialised corpora: In all three corpora, *voluntary sector* and *voluntary organisation* are salient, although in government sites the most salient phrase is *voluntary body*. In the academic and public corpora, *volunteer* as both noun and verb tends to appear in positive contexts, emphasising the benefits for both organisations – e.g. ‘Without these skilled volunteers, much of the annual bird monitoring ... would not be available’ (rspb.org.uk) – and volunteers – e.g. ‘Volunteering is an excellent way to gain experience’ (sussex.ac.uk). In the government corpus, where *volunteer* is more frequent than in either the public or academic corpus, there are more notes of caution about the use and management of volunteers, e.g.

‘Support for community groups needs to be long term and consistent otherwise there is the danger of activity declining or becoming disorganised resulting in volunteers becoming disillusioned and leaving.’ (fareham.gov.uk)

‘There is an over reliance on volunteers to collate biodiversity information Marine Biodiversity.’ (eera.gov.uk)

Amateur and professional

UKWaC: Both senses of *amateur* (adjective and noun) are used in UKWaC: the neutral sense ‘not professional/someone who does their job for pleasure’ and the negative sense ‘unskilled/someone who is not skilled at what they do’. Key collocates include the positive *enthusiastic* and *gifted*; the slightly negative *well-meaning* and *bungling*; and the more strongly negative *rank*. In a sample of 100, there was a mixture of neutral uses (‘a show about amateur engineering’; offthetelly.co.uk), positive uses (‘Often, it’s the amateurs, or academics working in their spare time, who produce the most useful, stimulating web resources’; earlymodernweb.org.uk) and negative uses (‘the incredibly poor technical standards – it gave the impression of being run by amateurs’; tvradiobits.co.uk). *Professional* is over 15 times more frequent than *amateur* in UKWaC, and while they share some collocates such as *footballer* and *archaeologist*, there are differences: *naturalists*, *gardeners* and *botanists* are more likely to be referred to as *amateur* than *professional*, while *professional* is more likely to be emphasised by *truly* and *totally*. Of a sample of 100, all citations with *professional* were neutral or positive.

Main differences in specialised corpora: In the specialised corpora, *amateur* is almost entirely used in neutral or positive contexts, for example ‘natural history societies staffed by knowledgeable amateurs’ (guardian.co.uk) and ‘interaction between networks of amateur experts, conservation agencies and policymakers’ (genomicsnetwork.ac.uk). There was only one citation, in the government corpus, which used the ‘unskilled’ sense of *amateur*, with additional connotations of fraudulence: ‘It [the pearl mussel] is declining... due to the activities of legitimate professional and amateur or “cowboy” pearl fishers’ (jncc.gov.uk). *Professional* is neutral or positive in all three corpora, collocating with words such as *skill* and *expertise*.

****Expert and expert knowledge***

UKWaC: Key phrases with the noun *expert* include *expert in the field of...*, *leading/acknowledged/foremost/renowned/expert*, and *expert witness/advice/opinion*. Salient verbs used with *expert* as a subject include *warn*, *believe* and *predict*. The adjective *expert* modifies *advice*, and is modified by *technically* and *sufficiently*. There are also salient collocates indicating the occasional scepticism related to the word *expert*: *so-called* and *supposedly*, e.g.

‘Many of the so-called experts who pushed the green revolution are now pushing the gene revolution.’ (permaculture.co.uk)

Of a random sample of 100 citations of *expert* and 100 of *expert knowledge*, all were neutral or positive, indicating the use of *expert* as a way of lending authority to claims:

‘We are a top band based in the South East and have become expert at providing quality entertainment to turn any event from ordinary to sensational.’ (theweddingnetwork.co.uk)

‘Meg also runs a busy quarantine kennel. As more and more people are travelling abroad with their animals, be it for dog shows or family holidays, Meg’s expert knowledge will help to make those journeys trouble-free.’ (ourdogs.co.uk)

Comparison with other words in UKWaC: The word that is used most similarly to *expert* is *specialist*. Both collocate with neutral verbs such as *advise* and *teach*, but *expert* occurs significantly more often with verbs such as *claim*, *suggest* and *believe*, where the verity of expert’s statements are in question. Similarly, both modify *knowledge*, but *expert* collocates more strongly with *opinion*. *Experts* are more likely to be *acknowledged* and *foremost*, but they are also more likely to be *so-called*. Thus, while both *expert* and *specialist* can be used with positive connotations, *expert* is more likely than *specialist* to be used in sceptical or critical contexts.

Expert also occurs in similar patterns to *professional*, *consultant*, *researcher* and *scientist*.

Main differences in specialised corpora: In the government corpus, all the references to experts are neutral or positive, with references to getting advice from experts, expert panels and experts’

warnings. In the academic corpus, there are neutral references as well as occasional concerns about the role of experts and the disparity between expert and public opinion, e.g.

‘...the potential for conflicts in deliberations increases... including challenges concerning the role of “science” and “experts”, particularly in relation to the ecosystem approach. Who will take the decisions?’ (bbk.ac.uk)

‘...academic research and accounts from the policy world reveal disparities between expert (scientific) and lay (non-scientific) understandings of the environment.’ (macauley.ac.uk)

In the public corpus, *expert* is sometimes used as a way of presenting statements with authority and impact, especially in newspaper headlines, e.g.

‘Invasive species threat growing globally, experts warn.’ (guardian.co.uk)

However, there are also a number of critical attitudes towards experts, particularly in readers’ comments on news articles, and particularly in relation to climate change:

‘The average person is NOT going to be convinced when some “expert” says there is a change of 1 degree! Especially if that expert (or his or her cohorts) are shown to be using questionable sources to draw conclusions.’ (bbc.co.uk; reader’s comment)

‘I am very skepticle [sic] about all the pronouncements [about global warming] that are made by the experts. I know how completely uncertain the subject is so I would say just don’t believe the experts.’ (greenpeace.co.uk; reader’s comments)

‘Experts told us BSE couldn’t jump species. Experts tell us GM crops are safe. Feeling confident?’ (guardian.co.uk; reader’s comment)

Expert knowledge does not occur at all in the academic corpus, and occurs only six times in the academic corpus and once in the public corpus. The single citation in the public corpus again indicates scepticism about the reliability of expert advice, again in the context of climate change:

‘Perhaps unwittingly, he [Lord Stern] rather exemplifies such an elitist view by insisting that we should above all listen to scientists when debating climate change. It is one thing to consult experts where they have expert knowledge to offer. It is another thing to leave it to them when deciding what to do. Climate change is, indeed, such a huge issue that we can not afford to leave it to elites and scientists.’ (guardian.co.uk; reader’s letter)

Specialist

UKWaC: Salient modifiers of the noun *specialist* include *nurse*, *epilepsy*, *diabetes*, *subject*, *clinical* and *accredited*, while *specialist* modifies *nurse*, *registrar*, *advice*, *knowledge*, *equipment* and *expertise*. The adjective *specialist* modifies *distributor* and *pharmacist*, and is frequently emphasised by *highly*. A random sample of 100 citations consisted of neutral or positive statements, with *specialist* often used in adverts or promotional sites:

‘Whether you’re after a sports kite, fountain pen, digital camera or just a bra that fits, you can’t beat specialist advice from staff who really know what they’re talking about and are passionate about their products.’ (blewater.co.uk/shop)

‘First Pasture Country Bookstore Specialists in countryside related books...’ (grow.co.uk)

Main differences in specialised corpora: Unlike those with *expert*, citations with *specialist* were all neutral or positive. In the public corpus, collocates include *species* (e.g. ‘specialist farmland species’) and *education*; in the government corpus, collocates include *advice*, *learning*, *group* and *knowledge*; and in the academic corpus the main collocates are *field* and *knowledge*.

Group 8. Diversity

****Diversity***

UKWaC: Key phrases include *celebrate/value/reflect/embrace/respect/promote diversity*; *cultural/biological/genetic/linguistic/ethnic diversity*; *species diversity*; *diversity and equality*; and *diversity in flora/habitat/wildlife/species*. A random sample of 100 citations showed the overwhelmingly positive use of *diversity*, whether in reference to culture, attitudes or species:

‘...if it costs us a few hundred £K to maintain a little of what makes the UK wonderful (diversity, quirkiness, regional languages)... then I am for it.’ (blue-witch.co.uk)

‘Especially exciting is the great diversity of whales and dolphins. In the last year an astonishing 16 different species have been sighted including 356 sightings of 14,145 different animals!’
(speysidewildlife.co.uk)

Comparison with other words in UKWaC: The word that is used most similarly to *diversity* is *variety*. Both collocate with words related to wildlife, including *wildlife*, *habitat*, *species* and *plant*, and both are used with positive modifiers such as *rich*, *infinite*, *incredible* and *amazing*. There are some differences: *diversity* tends to be used in work contexts (e.g. *diversity in the workplace*, *diversity within a profession*), while *variety* is used more with abstract collocates such as *style*, *method*, *way* and *reason*. Also, *diversity* is more likely to occur with strongly positive verbs including *celebrate*, *value*, *embrace* and *promote*; these verbs are used with *variety* but with lower salience.

Diversity also occurs in similar patterns as *complexity*, *understanding* and *innovation*.

Main differences in specialised corpora: In all three, the main collocates are *biological* and *genetic diversity* and, as in UKWaC, citations are generally positive, referring to the encouragement of diversity, or the problems caused by loss of diversity. In the academic and government corpora, the main verb collocates are *maintain* and *enhance*, sometimes occurring together, e.g.

‘It is important that the management of the site aims to maintain and, where possible, enhance the existing biological diversity.’ (bournemouth.gov.uk)

In the public corpus, *preserve* is more salient, e.g.

‘By preserving genetic diversity we are preserving species that may turn out to be more nutritious, better tasting, more resistant to pests....’ (bbc.co.uk)

In only a few cases was there a question mark next to the concept of genetic diversity and the uses to which this can be put, e.g.

‘Should we exploit natural genetic diversity to look for heartier variants?’
(genomicsnetwork.ac.uk)

Biodiversity

UKWaC: Key phrases are *conserve/enhance/safeguard/preserve/threaten/protect biodiversity* and *biodiversity conservation/hotspot/indicator/loss*. Of a random sample of 100 citations, most were neutral and objective: 11 were references to ‘biodiversity action plans’, and there were several other occurrences in titles of books and projects, e.g. the ‘London Biodiversity Project’ and the ‘Soil Biodiversity Programme’. In one citation, *biodiversity* is defined, indicating that it is perceived to be a term that is not generally understood:

‘Biodiversity is a term which simply means “the variety of life”.’ (offwell.free-online.co.uk)

This is also indicated in the following citation:

‘While... people generally understand a little about the greenhouse effect and global warming, bio-diversity is not understood. In a recent survey undertaken at Kew, many people thought biodiversity was a type of washing powder!!’ (sage-rsa.co.uk)

However, one citation gives a more personal and emotive argument about biodiversity:

‘The biodiversity issue... connects directly to the equity issues relating to right of all people to access to a means of livelihood-to a place on the earth. Some environmentalists believe that to protect biodiversity you must exclude people. In their view you either have production or you have protection. I have seen farms as beautiful as a native forest. I feel it important to bring ecology and biodiversity into the heart of production rather than keeping it outside.’
(environment.org.uk)

Main differences in specialised corpora: *Biodiversity* is more than one and a half times as frequent in the government corpus as in the academic corpus, and more than twice as frequent in the government as in the public. There are also differences in collocation: the most salient collocate in the public corpus is *loss*, with statements about the rate of biodiversity loss and how to reduce or reverse it, although the latter brought some scepticism:

‘How can you reverse the rate of biodiversity loss? Are you some kind of nutter? The world population is increasing and habitat is being taken by humans at the expense of other species.’
(guardian.co.uk; reader’s comment)

Loss is also salient in the academic corpus, but much less so in the government corpus, where there are the more positive collocates *conservation*, *action* and *indicator*, with references to plans and projects for increasing biodiversity.

Geodiversity

UKWaC: *Geodiversity* is too infrequent in UKWaC for salient collocates to be identified; indeed, it is the least frequent of the words and phrases analysed in this study. Twenty-eight of the occurrences (over a sixth of the total) were the phrase *geodiversity action plan*, and several other citations defined the term, or put it in inverted commas, indicating that it is not in widespread use:

‘Scotland contains an unrivalled Earth heritage diversity (or “geodiversity”)’ (snh.org.uk)

‘Many different definitions of “geodiversity” have been put forward since the term started to be widely used during the 1990’s.’ (glos.geotrust.org.uk)

Main differences in specialised corpora: *Geodiversity* is three times as frequent in the government corpus as in the academic corpus, and over 52 times as frequent as in the public corpus, where it occurs only twice. In the government corpus, *geodiversity action plan* is frequent, as is the phrase *bio-and geodiversity conservation*.

Group 9. Aesthetics, values and changes

Change

UKWaC: Key phrases with the noun *change* include *climate change*, *lifestyle change* and *regime change*; *significant/radical/major/fundamental change* and *propose/undergo/make change*. The most salient subjects of the verb *change* are *climate* and *circumstances*. A random sample of 100 citations included positive references to change (e.g. ‘The BHF recommends lifestyle changes to reduce the risk of heart disease’; ‘I am...grateful for this opportunity as it has changed my life in so many ways’; ‘...work for change in the poorest areas’), neutral ones (‘foliage may change colour rapidly and uniformly’) and negative ones (‘...plans on how to manage change and disaster’; ‘a time of great change and uncertainty’).

Main differences in specialised corpora: In all three corpora, *climate*, *land* and *use* are the strongest collocates, and the phrases *climate change* and *land use change* are analysed separately in this report. In the academic corpus, the strongest verb collocates of the noun *change* are *predict* and *monitor* – e.g. ‘improvement in scientists’ ability to predict environmental change’ – whereas in the government and public corpora the key concern is with how to *tackle* and *combat* change (usually climate change). The public corpus also has key collocates relating to positive changes in *attitude*, *practice* and *thinking*, for example ‘the change in public attitude towards waste has been spectacular’ (guardian.co.uk). Collocates of the verb *change* include *attitudes* and *patterns* in all three corpora, and in the public corpus a strong collocate is *way*, e.g. ‘This understanding should change the way we think about conserving the natural world and forests in particular’ (woodlandtrust.org.uk).

Dynamics

UKWaC: Salient collocates include the verbs *simulate*, *model*, *probe* and *understand*, the nouns *ecosystem*, *interaction* and *population*, and the adjectives *fluid* and *nonlinear*. Of a random sample of 100, many occurred in objective academic contexts, in a variety of disciplines including sociology (*group dynamics*, *cultural dynamics*) and science (*molecular dynamics*).

Main differences in specialised corpora: *Dynamics* is over ten times more frequent in the academic corpus than in either the government or public corpus. Its most salient collocates in the academic corpus are *vegetation*, *population* and *carbon*.

Interaction

UKWaC: Salient modifiers of *interaction* include *face-to-face*, *social*, *complex* and *human-computer*, while salient verbs are *mediate*, *facilitate* and *model*. Most of the random sample of 100 were from academic contexts (for example, *cell interaction* and *plant-microbe interaction*) and were neutral and objective. Where *interaction* is used in general public discourse – usually in the sense ‘conversation, working with people’ – it has positive connotations:

‘You can have the same level of interaction as with a face-to-face appointment - all from the comfort of your desk.’ (asta.co.uk, promoting software)

‘...successful interactions between doctors, nurses, managers and their multidisciplinary colleagues.’ (asme.org.uk)

Main differences in specialised corpora: *Interaction* is much more frequent in the academic corpus than in the government or public corpus. It is generally used in neutral objective contexts.

****Value***

UKWaC: The various senses of the noun *value* can be seen in its key collocates in UKWaC. The sense ‘amount of money that something is worth’ is frequent: the phrase *value for money* is highly salient, and other strong collocates are *shareholder* and *rateable*. The sense ‘importance, usefulness’ – i.e. what something is worth, but not necessarily in terms of money – is also evident in the strong collocate *add*. References to *adding value* sometimes refer to monetary value, but sometimes refer to other forms of worth, e.g. ‘a good review of an achievement ... adds value and significance to the original achievement’ (reviewing.co.uk). The other sense, when the plural form *values* is used, is ‘what people believe to be important’. This sense is evident in the collocates *beliefs* and *attitudes*. Of a random sample of 100, only seven citations used the sense ‘beliefs’, all of which were positive (e.g. ‘the values, attitudes, beliefs and behaviours which strengthen the fibre of a healthy society’, bahai.org.uk). The remaining citations were mainly about money, although with a few references to non-monetary worth, e.g. ‘the continuing value of the link between teaching and research’ (admin.ex.ac.uk). The citations also show that when people refer to the value of something, they generally mean its *high* value or *good* value, and references to ‘low value’ are rare (only one in 100 citations). Indeed, the positive connotations of *value* mean that when it is used on its own without an adjective, it means ‘good value’ or ‘value for money’, as in ‘We had planned and budgeted for a value campaign in the important lead up to Christmas’ (j-sainsbury.co.uk).

Comparison with other words in UKWaC: Words which are used similarly to *value* include *level*, *number*, *quality* and *cost*. A comparison with *quality* is interesting. There are several similar phrases, including *good value/quality*, *intrinsic value/quality* and *deliver value/quality*. However, *land*, *heritage* and *conservation* are much more likely to collocate with *value* (there are far fewer instances of *land quality*, *heritage quality* and *conservation quality*). Also, there are several monetary collocates which are more salient with *value*, e.g. *value for money* and *value of commodity*, which are less salient with *quality*. On the other hand, there are significantly more occurrences of the phrase *the quality of the environment* than *the value of the environment*.

Main differences in specialised corpora: The strongest collocate in the academic corpus is *intrinsic*, with frequent references to the idea that nature has value separate from its usefulness to humans:

‘...although the wilderness was vital to human health and well-being, it also had intrinsic value independent of any usefulness to humans and deserved human protection.’ (lancs.ac.uk)

In the government corpus, key collocates are *nature* (often in the phrase ‘site/area of nature conservation value’), *cultural* and *high*. In the public corpus, *materialistic* and *self-enhancing* are frequent; all are from a WWF website which refers a problem it perceives in environmental campaigns, where the environment is framed in monetary terms:

‘Unfortunately, rather than working to decrease selfenhancing, materialistic values known to be associated with environmental degradation, some environmental campaigns probably serve

to reinforce such values. Indeed, the modern environmental movement is dominated by the perception that the environment is an economic resource to be exploited.’ (wwf.org.uk)
Other strong collocates in the public corpus – *money*, *monetary* and *economic* – indicate the extent to which environmental issues are perceived in financial terms in the public sphere:

‘By showing how we can place an economic value on biodiversity, it will help us to do the right thing nationally and internationally.’ (bbc.co.uk, quoting former Environment Secretary Hilary Benn)

Green

UKWaC: The most salient nouns which *green* modifies are *belt*, *light*, *space*, *vegetable* and *leaves*. *Green* collocates with other colour adjectives, but also with evaluative adjectives, which tend to be positive: *lush*, *pleasant* and *clean*. Of a random sample of 100 citations, many were neutral literal references to the colour green, and there were some additional idiomatic uses unrelated to the environment (e.g. give something the *green light*). There were five instances of *green space* (which is discussed separately in this report) and six citations referring to other types of ‘green’ land: *green land*, *green area*, *green belt*, *green corridor*, *green zone* and *green field*. A further 14 used *green* in the sense ‘environmentally friendly’: *green travel choices*, *green culture*, *green background*, *green measures*, *green minister*, *the green movement*, *green options*, *green property*, *green school*, *green taxes*, *green technology*, *green tourism*, *green government*, and *go green*. Almost all of these are framed positively, e.g. ‘encourage greener, cleaner and healthier travel choices’ (halton.gov.uk) and ‘green property will be more valuable than conventional buildings’ (davidlawson.co.uk, real estate website). However, one citation indicated scepticism:

‘Started up after Keith Hassle got all ‘green’ after hearing how much he’d be paid to manage the project. His green background began when he saw the funding.’ (kirkbytimes.co.uk)

Main differences in specialised corpora: *Green* is particularly frequent in the government corpus, largely because of the high frequency of *green space* (discussed separately). In all three corpora, key collocates are *space*, *infrastructure* and *belt*. In the public and academic corpora, there are several occurrences of the phrase *go green*, but this does not occur in the government corpus. It is also notable that in the public corpus, *go green* is used descriptively of, e.g. councils or politicians who ‘are going green’, and is also used promotionally:

‘In his article Mr Cameron claimed credit for pushing the environment up the political agenda and, with an eye on next month’s council elections, he highlighted the green record of Tory authorities. “Where people have voted blue, their councils have gone green,” he wrote.’ (guardian.co.uk)

In the academic corpus the concept of going green is positive, but there are references to problems associated with it, such as ‘the cost of going green’ or ‘barriers to going green’.

Solitude

UKWaC: The verb collocates of *solitude* in UKWaC indicate that it is something precious and rare: people *relish*, *savour* and *cherish solitude*; it is also something which is *shattered* and *disturbed*. However, one of the strongest adjective collocates is *dreary*, indicating another aspect to *solitude*; ‘loneliness’. Of a random sample of 100, many were from religious or literary contexts, referring to the solitude of meditation and reflection. Overall, references to *solitude* were positive, and sometimes used promotionally in tourism websites:

‘you can find everything from the peaceful solitude of fishing or a sedate canal boat trip to exciting whitewater rafting’ (borderlands.co.uk)

‘...savouring the solitude as we guide you through three spectacular mountain ranges’ (skedaddle.co.uk)

Main differences in specialised corpora: *Solitude* is very infrequent in all three corpora, with only seven occurrences in the academic corpus, three in the public and one in the government. The references are positive, e.g. *opportunities for solitude*, *a precious land of solitude*.

Peace, peaceful and peacefulness

UKWaC: *Peace* has several related senses indicated by its key collocates: ‘lack of war’ in *peace protest, peace treaty*; ‘lack of noise and disturbance’ in *disturb the peace* and *peace and tranquillity*; and ‘lack of worry’ in *peace of mind*. *Peaceful* is also used in political contexts, e.g. *peaceful protest*, but most of the collocates indicate the sense ‘of a place where there is no noise/disturbance’, e.g. *peaceful surroundings/haven/retreat* and the collocating adjectives *relaxing, tranquil* and *calm*. *Prosperous* is also a salient collocate, usually in phrases referring to ideals such as ‘a peaceful and prosperous future’ and ‘Asia can become a peaceful, prosperous region’. *Peacefulness* is rare (almost 500 times less frequent than *peace*), and its frequency is too low to determine strong collocates, although some recurrent phrases include *savour peacefulness* and *peacefulness and calmness*. Of a random sample of 100 citations with *peace* (the most frequent form), most used *peace* in contrast to *war*, and there were also several references to *peace of mind*. Only two referred to the tranquillity of nature:

‘The abbey’s main walls remain amid a setting of greenery as an oasis of peace.’ (cypnet.co.uk)
 ‘...you can enjoy the best of both worlds, the peace of the countryside and yet be within about one hour’s drive of the major attractions of Devon and Cornwall.’ (atlantic-highway.co.uk)

Main differences in specialised corpora: *Peacefulness* does not occur in any of the three corpora. *Peaceful* occurs 12 times in the public corpus, with five references to politics (*peaceful protests/upheavals*) and seven to places (*peaceful woods/ecosystems*). All ten occurrences in the government corpus promote peaceful places, both for humans and wildlife (‘a peaceful and relaxing place to visit’, ‘a safe and peaceful place for seals to pup’), and the ten occurrences in the academic corpus are a mixture of book titles and references to policies (e.g. ‘Build democratic societies that are just, participatory, sustainable, and peaceful’). *Peace* is slightly more frequent in all three corpora. Almost all citations in the public corpus express the ‘lack of war’ sense, e.g. in *peace prize, middle east peace*, while in the academic and government corpora these are mixed with the ‘tranquillity’ sense, e.g. in *peace and tranquillity* and *disturb the peace*.

Beauty and beautiful

UKWaC: Key phrases with *beauty* include *appreciate/admire/ behold beauty, outstanding/natural/scenic beauty, beauty salon* and *beauty and tranquillity*. Of a random sample of 100 citations, about a fifth referred to physical beauty of humans, e.g. in *beauty salon* and *beauty treatment*; over a quarter referred to the beauty of nature, particularly in *natural beauty* and *beauty spot*; and the remainder referred to the beauty of abstract things such as music and art. *Beauty* is almost always portrayed as positive, although there is an interesting use of the phrase *conventional beauty*:

‘This part of Cornwall, exploited for as long as almost anywhere in Europe, appears to thrive on disregard for conventional beauty. Here, the gorse survives, and the prickliness of scavengers and borderline farmers ... ultimately defends the land against those who would declare it valuable for tourism only.’ (artspacegallery.co.uk)

The implication here is that *beauty* is superficial, and only for tourism, and that the land has underlying value irrespective of beauty. *Beautiful* is about twice as frequent in UKWaC; strong collocates include *scenery, countryside, beach, surroundings* and *garden*.

Main differences in specialised corpora: In the public and government corpus, two of the most salient collocates of *beauty* are *outstanding* and *natural*, which often occur together in the set phrase *area of outstanding natural beauty*. *Beautiful* is less frequent in all three corpora (possibly because it was not used as a seed word in the building of the corpora), and is used positively and often personally in descriptions of nature, e.g.

‘The florid nature of a really beautiful orchid or some kind of very rare plant that you see for the first time is really amazing.’ (guardian.co.uk)

Freedom

UKWaC: Salient phrases with *freedom* include *restrict freedom, defend freedom, freedom and democracy, freedom of expression/speech, fundamental freedom, religious freedom* and *freedom fighter*. In a random sample of 100, all citations were positive, sometimes markedly positive, e.g. ‘freedom is a precious thing’, ‘the gift of freedom’. In political contexts, *freedom* is often an emotive word used to encapsulate inherent Western values and how they are supposedly being threatened:

‘...they [Iraq and Afghanistan] detest the freedom, democracy and tolerance that are the hallmarks of our way of life’ (number-10.gov.uk; Tony Blair’s opening speech in debate over war in Iraq)

Main differences in specialised corpora: *Freedom* is also used positively in the specialised corpora, e.g. in ‘There are few things that can lift the spirit, or inspire a sense of freedom, as time spent – however fleetingly – with nature’ (defra.gov.uk) and ‘The magical feeling of freedom while walking the moors’ (guardian.co.uk). However, there are also reminders that *freedom* is sometimes overused as a defence of actions which may have negative effects, such as driving cars and overpopulating:

‘...freedom to use automobiles does cause harm to humans in a variety of ways...’

(lancs.ac.uk)

‘Do we agree that freedoms are no good without responsibilities? Let’s say yes. So let’s put an end to this “Go forth and multiply” nonsense somehow before we end up in a fecund cesspit of our own making.’ (bbc.co.uk)

Independence

UKWaC: Key phrases include *regain/declare/assert independence; independence of the judiciary; editorial/judicial independence; and independence and objectivity/impartiality*. Of a random sample of 100 citations, all were positive in connotation, in phrases such as ‘risk of losing independence’, ‘struggle for independence’ and ‘encourage children to develop a sense of autonomy and independence’. Like *freedom*, *independence* is a politically loaded word and is often used emotively, e.g.

‘Everyone who cherishes their country’s national democracy and independence and who is opposed to the institutional monster that has grown up in Brussels...’ (irishdemocrat.co.uk)

Main differences in specialised corpora: *Independence* is relatively infrequent in the specialised corpora (18 occurrences in the academic corpus, six in the government and five in the public). Most references in the academic corpus are to specific countries gaining independence.

Attachment

UKWaC: *Attachment* is frequent in the sense ‘file appended to an email’, as seen in the strong noun collocates *email* and the verb collocates *open, download* and *zip*. Various physical *attachments* are also indicated, e.g. in *shower* and *forklift*. The emotional sense of *attachment* is indicated by the adjective collocates *sentimental* and *emotional*. Of a random sample of 100, most referred to email attachments, and only about a fifth referred to emotional attachment. These were of mixed attitudes. In some cases, attachment was portrayed as negative, e.g. ‘abandoning every worldly attachment for the sake of proximity to Allah’ (hawza.org.uk), or potentially negative, e.g. ‘The greater the attachment, there is obviously the greater potential for loss’ (acsedu.co.uk). Some were neutral, e.g. in ‘romantic attachment’, and in some cases attachment was portrayed as a positive concept, e.g. ‘Various attachments to community groups and partnership agencies will help the students understand the real issues of the communities they will be policing’ (warwickshire.police.uk).

Main differences in specialised corpora: *Attachment* occurs only nine times in the academic corpus (mostly in the emotional sense, e.g. in *spiritual attachment, attachment to the idea of wilderness*), and only once each in the government and public corpora.

Sense of place

UKWaC: Of a random sample of 100 citations, some referred to the ‘sense of place’ evoked by artists and authors in their works, but most referred to the ‘sense of place’ felt by people in a community. Citations stressed the importance of belonging to a local community, e.g.:

‘...to restore the link between the individual and their local environmental heritage, thus giving ordinary people back their sense of place, their sense of belonging.’ (britarch.ac.uk)

‘While we spend our money abroad less is spent at home; no trade for local shops and leisure services, less contact with our neighbours, less time spent establishing a sense of place and of belonging to the community.’ (headheritage.co.uk)

Main differences in specialised corpora: The phrase ‘sense of place’ is more frequent in the government corpus than in either the public or academic corpus. In the government corpus, there is a mixture of positive references to the way that local environment can create/provide/confer a sense of place, and negative references to the loss of a sense of place through, for example, the removal of woodland.

Spiritual

UKWaC: Key phrases with *spiritual* include *spiritual dimension/awakening/realm/gift/healing*; other strong collocates are *moral* and *emotional*. Of a random sample of 100 citations, most presented spirituality as an aim, for example ‘a spiritual path’ and putting people in touch with their ‘spiritual side’. *Spiritual* is used both in the sense ‘relating to religion/God’, e.g. references to churches as ‘spiritual places’, and in the sense ‘not physical or material’, e.g. ‘the effect that the emotional/spiritual health of person will have on their body’ (childalert.co.uk).

Main differences in specialised corpora: In all three corpora, the primary use of *spiritual* is with reference to what nature offers humans. This is often framed in the language of value, wealth and service:

‘...wilderness as a site of spiritual renewal, a place offering a huge range of values to all humans.’ (lancs.ac.uk)

‘The aesthetic and spiritual value of the living world is also important and there is wide acceptance of the obligation to pass on to future generations the natural wealth that we have inherited.’ (leeds.gov.uk)

‘Biological resources feed and clothe us and provide housing, medicines and spiritual nourishment.’ (wwf.org.uk)

Fear and anxiety

UKWaC: Key phrases in UKWaC include *fear(s) about terrorism/immigration/safety, fear of crime/reprisal/the unknown, irrational/well-founded fear* and *allay/conquer/overcome fear*. A random sample of 100 citations showed wide-ranging objects of fear, from ridicule to crime to immigration. One also remarked upon ‘the climate of fear and suspicion that now pervades many urban areas’ (ben-network.co.uk). While *fear* tends to refer to specific concerns, the key collocates of *anxiety* indicate that it refers to more general on-going worries: *anxiety and depression, anxiety about the future, needless anxiety* and *anxiety disorder*. *Fear* is over four times more frequent than *anxiety* in UKWaC.

Main differences in specialised corpora: *Fear* is over three times more frequent in the public corpus than in either the academic or government corpus, and it is predominantly used with reference to climate change or general environmental problems. Notably, only one citation in the public corpus referred to fear experienced by animals (‘Gone is the “ecology of fear” that kept browsers on the move’, guardian.co.uk); the rest referred to human fears. Two citations also comment on the negative and unhelpful nature of fear when used as part of environmental debates:

‘...the language of fear and of terror and of anguish – it disempowers people.’ (bbc.co.uk)

‘...the fear of climate change is like a religion in this vital sense, that it is veiled in mystery, and you can never tell whether your acts of propitiation or atonement have been in any way successful.’ (telegraph.co.uk)

Anxiety is less frequent than *fear* in all three corpora. It is most frequent in the government corpus, where it is used both in the context of the stress that animals experience – ‘major changes should be introduced over time to ensure that they are successful and to prevent anxiety’ (defra.gov.uk, on primate welfare) – and public concerns – ‘Green spaces are potentially sites of crime and can thus create anxiety’ (londonhealth.gov.uk).

Destruction and destroy

UKWaC: Key collocates of *destruction* are *mass* (in ‘weapons of mass destruction’) and *stockpile*, indicating the frequent military use of the word. However, other strong collocates include *rainforest*, *habitat* and *ozone*. *Destroy* is almost twice as frequent as *destruction*, and collocates with *livelihood*, *temple*, *enemy*, *crop*, *planet* and *habitat*. Many of the subjects of *destroy* are natural forces – *fire*, *earthquake*, *tsunami* – although other subjects indicate human responsibility – *bomb*, *bombing*, *vandal*. Of a random sample of 100 citations with *destroy*, most referred to humans or natural forces (especially fire) destroying property or land.

Main differences in specialised corpora: Both *destruction* and *destroy* are over twice as frequent in the public corpus as they are in the government and academic corpora. A significant concern in the public corpus is the *destruction of rainforests/forests*, whereas in the government and academic corpora *rainforest* is not a strong collocate; more references are to the destruction of habitats.

Damage

UKWaC: The key collocates of the noun *damage* in UKWaC indicate that it is most frequently used in terms of health (e.g. *brain damage*, *liver damage*, *damage to nerves*) and property and possessions (*criminal damage*, *damage to property*). The phrase *collateral damage* is also frequent. The non-physical sense of *damage* is indicated by the salient phrase *damage to reputation*. Key object collocates of the verb *damage* include *reputation*, *credibility*, *ligament*, *brain* and *nerve*, and also *environment* and *crops*. Subjects of *damage* include *vandal*, *fire* and *frost*. Of a random sample of 100 citations of *damage* (both noun and verb), all were negative: almost all referred to damage to the body or damage to property; and only two referred to environmental damage:

‘...the creation of GM superweeds which may lead farmers to use more herbicides, resulting in increased damage to biodiversity.’ (christian-ecology.org.uk)

‘Culverting destroys wildlife habitats, damages natural amenity and interrupts the continuity of linear habitats.’ (shrewsbury.gov.uk)

Main differences in specialised corpora: In all three corpora, the noun *damage* (which is much more frequent than the verb) collocates strongly with *cause* and *irreversible*. The phrase *collateral damage* – which in UKWaC is almost always used as a euphemism for civilians killed in war – is used several times in both the academic and public corpora to refer to unintended harm to the environment:

‘Reduce collateral damage done by fishing.’ (york.ac.uk)

‘... politicians... should not reach an agreement to try and alter the climate without a better idea of the collateral damage.’ (bbc.co.uk)

This phrase does not occur in the government corpus.

Loss

UKWaC: Strong collocates of *loss* relate to money (*earnings*, *profit*) and health (*weight*, *appetite*, *hair*, *hearing*). Of a random sample of 100, almost all the citations were negative, with references to loss of data, loss of jobs, loss of species, and the euphemism *loss* meaning ‘death’, e.g. ‘the loss of my husband’. The only positive citations were the seven instances of *weight loss*, which is portrayed as desirable, perhaps mitigating the overall negative connotations of the word *loss*.

Main differences in specialised corpora: In all three corpora, *biodiversity* and *habitat* are the strongest collocates. *Forest* is also a strong collocate in the public corpus – e.g. ‘At least 90 per cent of forest loss is caused by human activities’ (wwf.org.uk) – but not in the other corpora. A notable difference is that whereas in UKWaC the strongest verb collocates are *suffer* and *incur*, the strongest verb collocate in the three specialised corpora is *halt*, indicating a concern not just with loss happening, and who it happens to, but how we can stop it. *Reverse* is also a strong collocate and sometimes co-occurs with *halt*, e.g. ‘To halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats’ (edinburgh.gov.uk).

Group 10. Culture

Cultural and culture

UKWaC: Salient collocates of *cultural* are *heritage*, *diversity*, *identity*, *context* and *difference*. *Cultural* has two main senses: ‘relating to the arts’ and ‘relating to a particular society or way of life’. The first sense is evidenced in examples such as ‘Soak up the cultural wealth that the galleries, museums and exhibitions offer’ (holidaylettings.co.uk) and the second, more frequent sense, in citations such as ‘You will find a host of attractions to enjoy in Inverness, with historic and cultural delights’ (cheaphotels.co.uk) and ‘education systems which support pluralism and cultural enrichment’ (ccrui.gov.uk). The strong positive associations of *cultural* were evident in the sample. Salient collocates of *culture* include *popular*, *Western* and *contemporary*. Again, citations with *culture* tend to be positive, although there are also negative uses of *culture* in the sense ‘ideas of a group of people’, e.g. ‘the growth of a culture which condones bullying and harassment in the workplace’ (unison.org.uk).

Main differences in specialised corpora: *Cultural* is slightly more frequent in the academic corpus. In all three, the key phrase is *cultural heritage*, which is discussed separately in this report. In the government corpus, *asset* is also salient, indicating that *culture* is seen as a commodity. The phrase *cultural asset* is eight times more frequent in the government corpus than in the public and academic corpora.

Cultural diversity

UKWaC: Of a random sample of 100 citations, most were positive references to *fostering*, *promoting*, *celebrating* and *appreciating* cultural diversity. *Cultural diversity* is also used as a promotional phrase in tourism sites, e.g. ‘The stunning scenery, idyllic beaches and cultural diversity of this island make Barbados a tropical haven of tranquillity’ (ownersdirect.co.uk). However, there were also a few references to homogenization of cultural diversity, managing cultural diversity, and *cultural diversity issues*, indicating the underlying problems:

‘Currently work is going into a developing project that will...contribute to the current public debate on the significant aspects of managing cultural diversity in the UK’ (ox.ac.uk)

Main differences in specialised corpora: *Cultural diversity* is over six times more frequent in the academic corpus than in the government or public corpus, and over 22 times more frequent than in the government corpus, although most of the citations are from a single website (a document on sustainability, Queen’s University Belfast). This document links the concepts of cultural diversity and biodiversity, and also highlights the potentially problematic nature of the term:

‘Cultural diversity tends to be used as an excuse for applying different ethical standards in different 2 countries, although genuine cultural diversity supports the identity, culture and interests of indigenous peoples and local communities without compromising their human, labour, cultural and environmental rights.’ (qub.ac.uk)

Cultural heritage

UKWaC: Of a random sample of 100, recurrent phrases included *rich cultural heritage*, *natural and cultural heritage* and *preservation/protection of cultural heritage*. There were also several references to *damage to* and *impact on* cultural heritage, including one reference to the potential impact of renewable energy programmes on cultural heritage:

‘...local planning authorities will be expected to have full regard to the environmental implications of proposals to develop renewable energy sources including impacts on the cultural heritage.’ (britarch.ac.uk)

Main differences in specialised corpora: In the public corpus, most of the citations are from NGO websites stating their aim to *improve* and *enhance* cultural heritage, and referring to the ‘intimate relationship between natural and cultural heritage’ (nationaltrust.org.uk), while the government corpus highlights the need to take into account cultural heritage in any planning proposals. In the academic corpus, cultural heritage and environmental issues are frequently linked, e.g.

‘There are a multitude of perceived threats to cultural heritage posed by natural hazards, environmental pollution, transport, urban development and mass tourism itself.’ (mdx.ac.uk)

However, there is also a reference which highlights that the two are not always compatible:

‘The topic of Cultural Heritage has never been considered as an indicator in reports and legislation on pollution and climate change ...Hunting is a part of the British cultural heritage which goes back to the Romans and Normans.... What evidence is there of conservation benefits?’ (warwick.ac.uk)

Popular culture

UKWaC: The phrase *popular culture* seems to be largely used in academic discourse: of a random sample of 100 citations, over a third (36) were part of title of books or academic courses/modules. Several others were part of descriptions of books or other sources of information, e.g. ‘A range of web-based self-study resources on postwar France. The pages would cover the history, politics, literature, film and popular culture of France since 1945’ (well.ac.uk). When it is used in non-academic texts, *popular culture* is used both with positive connotations –

‘one of the most influential figures in popular culture of the last fifty years’ (faber.co.uk, promoting a book about Paul McCartney)

– and negative connotations:

‘the clear presumption in popular culture and tavern discourse (and supported by opinion polls) that to most people most of the time “UFOs /flying saucers” means “spacecraft” ...’ (magonia.demon.co.uk)

Main differences in specialised corpora: *Popular culture* occurs only six times in the academic corpus (three of which occurrences are in book titles) and not at all in the government or public corpora.

Group 11. Land and land use

Land use change/land-use change

In all the corpora, *land use change* is more frequent than *land-use change*.

UKWaC: Of a random sample of 100 citations, most were objective statements in academic texts, e.g.

‘Existing models of the effect of climate and land use change on soil organic carbon stocks have generally been designed for mineral soils.’ (ceh.ac.uk)

Many were negative, e.g.

‘Damage, destruction and degradation of areas due to land use change...’ (nbu.ac.uk)

However, there was one positive citation:

‘Real gains that can be made through land use change and development have often been ignored or marginalised’ (rcep.org.uk)

Main differences in specialised corpora: *Land use change* is most frequent in the academic corpus. In all three, as in UKWaC, it is generally presented negatively, although there are a few positive citations, e.g.

‘Encouraging management techniques and land use changes that deliver multiple benefits for the environment, society and economy...’ (nationaltrust.org.uk)

There are also references to *managing land use change*, and to *negative* or *desirable land use change*.

Green space/greenspace

In all the corpora, *green space* is more frequent than *greenspace*.

UKWaC: Of a random sample of 100 citations, all were either neutral objective statements about the existence of green spaces, or positive comments about the varied benefits of these to humans and wildlife, usually in environmental websites:

‘... grants to communities to develop new green space and improve quality of life.’
(wildlifetrust.org.uk)

‘... high quality parks and green spaces contribute to the economic vitality of, and confidence in, a locality.’ (greenconstruction.co.uk)

‘The flexible nature of greenspace and the lack of social stigma attached to them, means they are ideal settings for cultural and art activities.’ (greenspacescotland.co.uk)

‘Amphibians are able to survive in the wilder green spaces in towns and suburban gardens.’
(btcv.org.uk)

Almost all the citations referred to public green spaces, but there was one use of the term to mean private areas of greenery:

‘The benefits of keeping greenspace in your front gardens are as follows: More privacy and screening Reduction in road noise heard in the house....’ (beechgrove.co.uk)

Main differences in specialised corpora: *Green space/greenspace* is over seven times more frequent in the government corpus than in the public corpus, and over 14 times more frequent in the government than in the academic. In the government corpus, there are frequent references to green space strategy, to encouraging accessibility to green spaces, and to benefits to communities, although there are also a few notes of caution, e.g.

‘Consultation is key to the success of a greenspace project, both to win support and allay fears and anxiety.’ (worcestershire.gov.uk)

Open space

UKWaC: A random sample of 100 showed that *open space* refers to a wide variety of spaces, e.g.

‘highway verges and adjacent grassed open spaces’ (dartfordbc.gov.uk), ‘using the open space in the centre of a roundabout as an extended detention basin’ (ciria.org.uk), and several references to ‘parks and open spaces’. Most citations were neutral or positive, although, as with *green space*, there was an indication of the public fear that is associated with such areas:

‘Where possible the open spaces should have natural surveillance; this will make them both feel and be safer.’ (leadpartners.co.uk)

Main differences in specialised corpora: *Open space* is over five times more frequent in the government than in the public corpus, and over 15 times more frequent in the government than in the academic. In all three, there are references to the varied benefits of open spaces, including their economic benefits:

‘Good quality open space is known to have a significant, positive impact on house prices.’
(blackburn.gov.uk)

There are also references to the fact that open spaces must be well managed:

‘The present scheme’s failure to address habitat restoration on the open spaces within the proposed Eco-town.’ (rspb.org)

Urban park

UKWaC: Of a random sample of 100 citations, most were neutral descriptions of particular urban parks or urban park rangers, or positive references to their benefits to communities, health and the economy, e.g.

‘Physical inactivity has serious effects on human health, which cost the UK economy over £8 billion a year. The potential value [of] an urban park, in terms of the costs saved from avoided inactivity has been estimated for the major cities of the UK.’ (nottsbag.or.uk)

However, there were also two references to their misuse and degradation:

‘Green public spaces like urban parks are being lost or left in a poor state of upkeep, where they are not being sold off to private speculators.’ (isj.org.uk)

‘Next door was a small urban park which had become the haunt of drug and solvent abusers.’ (hm-treasury.gov.uk)

Main differences in specialised corpora: *Urban park* is infrequent in all three corpora compared with *green space* and *open space*.

Allotment

UKWaC: Salient noun collocates are *gardening*, *holder*, *plot* and *gardener*, while salient adjective collocates are *derelict*, *disused*, *unused* and *overgrown*. Despite the negative connotations of these adjectives, all citations in a sample of 100 were either neutral, referring to allotment provision and management, or positive, referring to the benefits of having allotments, e.g.

‘It’s always treated as a negative stereotype but having an allotment is a great way for old people to keep active.’ (sovereignty.org.uk)

‘Projects such as establishing allotments and community gardens engage inner city communities in improving the local environment and producing fresh fruit and vegetables, leading to employment, improved diet and a stronger sense of community.’ (officialdocuments.co.uk)

Main differences in specialised corpora: *Allotment* is most frequent in the government corpus, less so in the public, and rare in the academic corpus. Citations indicated concern over lack of allotments and development of land, but there was no negative use of the word itself. Indeed, many of the citations are positive in all three corpora; even an instance of *abandoned allotment* is in fact a positive reference:

‘... those millions of us who live in town are particularly fortunate because our “local countryside” is made up of parks and cemeteries, railway sidings, waste tips, overgrown quarries, abandoned allotments, neglected gardens. In other words, a wonderful mosaic of wildlife habitat.’ (telegraph.co.uk)

Garden

UKWaC: Salient modifiers of *garden* include *landscaped*, *enclosed*, *walled*, *rear*, *back*, *front*, *botanical*, *communal*, *beautiful*, *herb*, *courtyard* and *beer*. *Garden* modifies *furniture* and *waste*. A sample of 100 showed the positive associations that gardens have, and the promotional use of the word *garden* to connote peace and space, e.g. ‘With a tranquil garden setting, this lovely bed and breakfast...’ (tailor-made.co.uk). Several citations referred to garden design and planning, and there were also five references to encouraging birds in one’s garden.

Main differences in specialised corpora: *Garden* is most frequent in the public corpus. In all three, there are references to both private/domestic gardens and public ones, and their benefits, e.g.

‘Gardens with orchards, walls, hedges, veteran trees, ponds and bogs provide habitats that may often be in landscapes denuded of such features.’ (nationaltrust.org.uk)

There are also a few negative references to the dumping of garden waste.

Landscape(d) garden

UKWaC: Most of the randomly-sampled 100 citations were from adverts for hotels or descriptions of houses on real estate websites; a few also referred to 18th century landscape gardens. The gardens were described as *beautiful*, and often measured in terms of acreage, e.g. ‘This five-star hotel is set in 13 acres of landscaped gardens...’ (independent.co.uk)

Main differences in specialised corpora: There are no occurrences of *landscape garden* in the academic or government corpora, and only nine in the public.

Commons

UKWaC: Key collocates of the noun *commons* include *enclosed, unenclosed, undivided, upland, heath and green*. In a random sample of 100, there were a lot of irrelevant references (e.g. to the House of Commons) as well as to the protection and enclosure of commons, and to the reopening of commons.

Main differences in specialised corpora: In the academic corpus there are several references to the *commons register* and to managements of commons. In the government corpus, a fifth of the citations relate to public rights of access to commons. *Commons* is infrequent in the public corpus.

Access, public access and right to roam

UKWaC: Key phrases with the noun *access* are *gain/improve/allow/restrict access; easy/direct/instant access, disabled access, Internet/broadband/wireless access* and *disabled access*. The verb *access* collocates strongly with *Internet, database, content* and *information*. Of a random sample of 100 citations of both noun and verb, almost all referred to internet access or wheelchair access; a few to broadening access to education or health care; and a few to places such as pubs which are ‘easy to access’. There were only three citations referring to access rights to public places, all relating to disputes, e.g.

‘NGC... are not entitled to choose any access routes they like, contrary to their bullying approach to farmers. They must negotiate and agree routes with the farmers.’ (revolt.co.uk)

There are only ten instances of *right-to-roam* as a single word and 371 of the phrase *right to roam*. A random sample of 100 citations indicated the contentious nature of this topic, e.g. ‘some of the most controversial and politically-charged issues of our day, including land reform, the right to roam...’ (st-andrews.ac.uk). Seven citations were of the phrase *right to roam legislation*, including one of ‘the so-called “right to roam” legislation’ (daelnet.co.uk). The phrase *public access* is almost 15 times more frequent than *right to roam* in UKWaC. Of a random sample of 100 citations, about a fifth referred to access to information/the internet, and the remainder to physical access to places. As with *right to roam*, the issue of public access is presented as problematic:

‘The question of public access and vandalism needs to be solved.’ (jwaller.co.uk)

‘Many outdoor pursuits take place in environmentally sensitive areas where public access has to be managed in order to protect nature.’ (bobw.co.uk)

‘Public access is clearly desirable but needs to be managed in such a way as to avoid damage to the archaeological sites or to the landscape.’ (eng-h.gov.uk)

Main differences in specialised corpora: In all three corpora, a strong collocate of *access* is *public*, while in the public corpus *informal* and *free access* are also salient, and in the government corpus *outdoor* is a salient collocate. *Public access* is approximately three times more frequent in both the government and public corpora than in the academic corpus. In the public corpus, NGO websites present policies of providing or promoting free/informal public access. There are no occurrences of *right-to-roam/right to roam* in the academic corpus, and only five in the government and one in the public corpus.

Recreation

UKWaC: Key phrases in UKWaC are *recreation ground/facility*, *countryside recreation* and *open-air/outdoor recreation*. Of a random sample of 100 citations, ten were of the sense ‘creating again’, and the remainder were references to recreation spaces (*grounds, facilities, park, site*) or management (*board, body*). In three citations there was an explicit link between recreation and conservation, and in 13 *recreation* occurred in close proximity to either *local* or *community*.

Main differences in specialised corpora: *Recreation* is over three times more frequent in the government corpus than in the other two, and one of its most salient collocates is *informal*, often with some concern:

‘Informal outdoor recreation allowing the quiet enjoyment of the countryside is encouraged, but careful attention will be paid to the provision of associated ancillary facilities such as car parks and toilets in order to minimise their impact on the local scene.’ (decorum.gov.uk)

Urban and rural

UKWaC: Both *urban* and *rural* collocate with descriptive terms such as *area, landscape* and *setting*, and also with *poor*. *Urban* collocates more strongly with *regeneration*, and also with *green*, particularly in *urban green space*. *Rural* collocates more strongly with *economy, remote, isolated* and *beautiful* (the phrase *beautiful rural...* occurs over 30 times more often than *beautiful urban...*) *Rural* collocates with *idyll, idyllic* and *peaceful*, but there are no occurrences of *urban* with these words. Only *urban* collocates with *pollution*. In a random sample of 100 citations with *urban*, there were a few negative references to the problems encountered in urban areas, e.g. ‘Tackling urban isolation and encouraging neighbourliness’ (cehr.org.uk); ‘emissions continue to cause serious urban air pollution too’ (srtp.org.uk). There is also a positive use of *urban* meaning ‘fashionable, stylish’: ‘give your wardrobe an edgy urban attitude’ (fashioncaptial.co.uk). The other citations are objective statements, or positive references to actions taken to regenerate or renew urban areas. A random sample of 100 citations with *rural* consisted primarily of neutral references to *rural areas* and positive references to *rural development, rural tranquillity* and *rural retreats*, sometimes in direct contrast to urban life, e.g. ‘As a rural retreat from city life, North Shropshire really is second to none’ (go2.co.uk). However, there are also a few negative references: two associate *rural* with *isolation*; one refers to ‘lower rural wages’ (defra.gov.uk) and one turns the stereotypes of urban and rural on their heads:

‘Dreams of escape from our urban dystopia to rural idylls are shattered as foot and mouth disease spreads like wildfire across the country’ (poetrysociety.org.uk).

Main differences in specialised corpora: In the academic corpus, *urban* is about one and a half times as frequent as *rural*; in the government corpus they have similar frequencies; and in the public corpus *rural* is more frequent. In the academic corpus, a strong collocate of *urban* is *pollution*, whereas the collocates in the government corpus are more neutral or positive: *fringe, greenspace* and *regeneration*. In all three corpora *rural* is primarily associated with finance, collocating with *economy* and *livelihood*.

Group 12. Living things

Organism

UKWaC: Salient collocates include *modified (genetically modified organisms)* and *engineered (genetically engineered organisms)*, both relating to concerns over their safety. Another key collocate is *living*, which has more positive connotations and is associated with diversity. As well as this there are many collocates reflecting microorganisms (*multicellular* and *microscopic*) and many negative collocations (*pathogenic, invade, infect, toxin*). Of a random sample of 100 citations, the majority were neutral, but a sizeable proportion (around 20%) was negative e.g.:

‘Current methods to control biofouling rely on toxic chemicals to kill the fouling organisms - but these compounds also have detrimental effects on the wider marine ecosystems.’

(nerc.ac.uk)

‘To control this it is necessary to use a broad spectrum disinfectant active against viruses, bacteria, fungi and other pathogenic organisms.’ (antecint.co.uk)

There were a few positive examples e.g.

‘...as the larger organisms are less likely to survive a journey home, and the carnivorous larvae may eat the smaller organisms of interest!’ (microscopy-uk.org.uk)

‘Similarly, galactomannans are readily fermented by the beneficial organisms Bifidobacteria and Lactobacilli.’ (lsbu.ac.uk)

These citations also indicate the frequently academic and scientific use of the word.

Main differences in specialised corpora: There is a similar proportion of the term in the government and public corpora, but the academic corpus has over three times as many occurrences as the other two. The academic and government corpora both have *modified* (*genetically modified*) and *living* as salient collocates, with fewer negative collocates compared to UKWaC, and, along with the public corpus, more collocations related to diversity and ecosystems. The public corpus has a noticeable lack of *genetically modified organism* – only one occurrence:

‘So, genetically modified organisms. As a technology it’s like any technology, it has pluses and it has minuses - it can be used for good and it can be used for ill. It’s come on very fast, driven.’ (news.bbc.co.uk)

Also, the public corpus has citations relating to the needs and conservation of organisms.

***Species**

UKWaC: Salient collocates include many types which relate to conservation: *endangered*, *protected*, *endemic*, *richness*, *extinction*, *diversity*, *endanger*, *conserve* and *habitat*. The related concepts *genus* and *class* also occur as collocations. In a random sample of 100 citations, the vast majority were neutral and objective and concerned protection issues. There was one figurative use:

‘What is left of the union block vote in Labour’s constitution ought to be declared a protected species before Mr Blair’s hounds tear it limb from limb.’ (ventris.org.uk)

There was also one negative but objective use:

‘The freshly cut wood and sap of *Aspidosperma* species causes irritation of the eyes, nose, and throat, with general malaise.’ (bodd.cardiff.ac.uk)

Comparison with other words in UKWaC: The word which is used most similarly to *species* is *population*: both are modified by *native*, *human*, *animal*, *breeding*, *bird*, *insect*, etc.; both occur with the words *occur*, *inhabit* and *depend*, and both occur in the phrases *species/population of turtle/ape/deer/bat*, etc. However, *species* is significantly more likely to collocate with *endangered*, *endemic*, *rare* and *alien*, whereas *population* is significantly more likely to collocate with *indigenous*, *wild*, *entire* and *whole*. *Population* collocates more strongly with *density* and *dynamics*; *species* more with *diversity*.

Other words which occur in similar patterns to *species* include *bird* and *habitat*.

Main differences in specialised corpora:

All three specialised corpora had similar proportion of occurrences. All three had similar collocates as UKWaC except that the collocates *invasive* and *non-native* were more salient compared to UKWaC, partly owing to the nature of the corpora.

Population

UKWaC: Many salient collocates for this corpus pertain to human population: *aged/ageing*, *census*, *world*, *civilian*, *Muslim*, *illiterate* and *prison*. There are some that pertain to the animal kingdom (*dynamics*) and some (*estimate*, *density*) are used for both animal and human populations. In a sample of 100 citations the majority (approximately 90%) of citations concerned human populations. Most of

these were objective, but some 20% of the total was evaluative, for example referring to unfair distribution of resources among populations:

‘Only one fifth of the world’s population lives in the countries with the highest incomes, and at the same in these countries, 86 percent of the world gross domestic product and 68 percent of direct foreign investment is produced. And they control 74 percent.’ (arts.gla.ac.uk)

References to animal populations also included evaluative references to their growth or control:

‘...which probably explains why the chub population thrives so well, growing to weights in excess of 7 lb’ (total-fishing.co.uk)

‘Mink hunts, in conjunction with other forms of mink control such as shooting and trapping, help to reduce mink populations throughout Britain. Without Government funding it appears unrealistic therefore, that mink will ever be eradicated so reliance must be placed upon hunting across much of lowland Britain to maintain populations at manageable levels.’

(huntinginquiry.gov.uk)

Main differences in specialised corpora: Salient collocates (*bird, fish, human, wild, size, dynamics, density, growth*) reflected the focus on the animal kingdom of these corpora compared to the UKWaC, though *world* is still salient (especially in the government and public corpora), with citations relating to the human population. The government corpus had stronger salience of the human-related collocate *world* compared to academic and public. The public corpus is marked in having *reduce* as a salient collocation (it does occur in the academic corpus but is less salient). The citations are sometimes negative references to the reduction of animal populations:

‘...repeated annual breeding failures are now substantially reducing populations of certain species.’ (rspb.org.uk)

In some cases, there are evaluative judgements relating to the controversy over human population:

‘How many other incentive opportunities exist, and will we have ever again, to voluntarily reduce human populations on earth?’ (news.bbc.co.uk)

‘...its a good thing if the human population is drastically reduced, then, eh? The eco-space is a zero-sum game.’ (guardian.co.uk)

Native

UKWaC: The term is used as an adjective and a noun. The noun usages tend to pertain to humans (salient collocates are *civilise, immigrant* and *settler*, though also *pine*). These are less relevant for this study, so the focus will be on the adjective cases. Adjective cases are more common (75% of a random sample compared to noun usages). The salient collocates of the adjective are *non-native, American, English, speaker, tongue, woodland* and *species*, so again, many of the citations pertain to humans. The non-human usages tend to be positive:

‘The Oak is one of the largest and enduring of our native trees. The sturdy, massive trunk, the broad, rounded outline of its crown...’ (poole.gov.uk)

On the other hand, there seems to be more controversial issues raised with citations relating to humans:

‘So why does this demand for untrained native speaker teachers of English persist? This is particularly puzzling as the reasons why these teachers should not be employed are many. From a moral point of view, educational institutions should be under an obligation to ensure that.’

(scilt.stir.ac.uk)

Note that some usages relate to computing (e.g. *native format*).

Main differences in specialised corpora: The specialised corpora all have similar collocates, many of which pertain to the animal and plant kingdoms (*non native, species, grassland* and *woodland*).

Indigenous

UKWaC: The majority of usages concern human populations, and the salient collocates (*Amazonian, tribe, tribal, Mayan, Australian* and *population*) reflect this. *Non-indigenous* is also salient, and this often refers to species. There are other collocates relevant to the animal/plant kingdoms (*exotic*,

endangered, flora) but these have lower salience in UKWaC compared to those relating to humans. From inspection of a random sample of 100 citations, it can be seen that *indigenous* is often used with positive connotations in arguments, some controversial:

‘...how about the institutionalised slavery culture that the Spaniards imposed on African and indigenous American peoples, and that was conveniently justified by Christianity at the time?’ (quechua.org.uk)

‘It is a slap in the face to any indigenous person that the people who were the most responsible for our genocide are also now claiming to be concerned about our well-being. I mean that is offensive.’ (liberation-mag.org.uk)

‘By 2020, an extra 5 - 7 million immigrants will have entered Britain, whilst immigrant communities already resident here are having more children than the indigenous British people. The estimates for the numbers of illegal immigrants resident in the country vary from 250,000 to over a million. To ensure that we do not become a minority in our own homeland.’ (bnp.org.uk)

Main differences in specialised corpora: The academic, government and public corpora also have a greater number of salient collocates relating to humans, but the actual collocates vary. The academic corpus has the following salient collocates: *people, culture, local* and *spiritual*. The salient collocates that relate to plants and animals are very low frequency. For the government corpus the salient collocates are *local* and *people* (again flora/fauna related collocates have very low frequency) and in the public corpus the collocates are *local, community* and *tribe*. Occurrences with flora/fauna related concepts all appear to be positive. *Indigenous* is most frequent in the academic corpus, and least frequent in the government corpus.

Invasive

UKWaC: The salient collocates are *non-native, species, carcinoma* and *pneumococcal*, along with many other medical terms relating to tumours, surgery and bacteria. The 100 citations indicated the strong negative connotations of the word:

‘However there are others that, without the checks provided by their natural predators, are highly invasive here and can be detrimental to natural habitats or native species.’ (snh.org.uk)

‘This is quite an invasive procedure and so not done as a first choice investigation. Essentially, using a special liver biopsy needle.’ (endocrinesurgeon.co.uk)

‘...intend to build new primate research laboratories on the outskirts of the city, where monkeys would be housed underground and subjected to cruel invasive brain experiments.’ (x-cape.org.uk)

Main differences in specialised corpora: The academic, government and public corpora all have similar collocates (*non native, alien, species, plant*) also with strong negative connotations. The academic and public corpora have similar frequency, but the government corpus has approximately half as many occurrences as in the other two.

Extinction

UKWaC: *Extinction* has negative connotations, co-occurring with words like *threaten, risk* and *driven to*. It tends to be used in evaluative statements, e.g.

‘A recently published study co-authored by WWF suggests that a quarter of the world’s species will be on their way to extinction by 2050 as a result of global warming “It isn’t just polar bears and penguins that we must worry about anymore.”’ (wwf.org.uk)

Strong collocates in UKWaC are *speciation, dinosaur, mass, Cretaceous, coefficient, face, species* and *cause*, but from a random sample of 100 citations we note that a large proportion concerned diverse objects of extinction including languages, laws, passions, people, industry, church, volcanoes, and farmers, as well as dinosaurs and species.

‘The sacrifice of identity is a price too high to pay, and an unnecessary one. It has been shown that languages can be saved even from the brink of extinction. Speakers can be recorded.’
(scilt.stir.ac.uk)

Main differences in specialised corpora: As with UKWaC, in all the specialised corpora *extinction* tends to be used in evaluative statements. There is a marked frequency difference: the government corpus has only a third of the occurrences as in the academic corpus, which itself has less than half as many as in the public corpus. Most of the salient collocates in the academic corpus have very low frequency and only occur in one or two documents. The collocates *mass* and *deforestation* are reasonably salient and there are many low frequency collocates related to dinosaurs and the plant and animal kingdom. The government corpus has *species*, *rate* and *loss* as salient but low-frequency collocates for *extinction*. The public corpus has more salient collocates (*species*, *mass*, *face*, *cause*, *dinosaur*, *plant*, *animal* and *prevent*) due to its greater frequency for this term.

Group 13. The animal world

Fauna

UKWaC: *Flora* is an extremely salient collocate of *fauna* in this and all corpora. There are also other collocates pertaining to the animal kingdom, including *invertebrate*, *vertebrate* and *mammal*. Other collocates are *geology*, *ecology* and *wildlife*, though the latter two are of medium rather than high salience. In the sample of 100 citations, the term is positive, co-occurring with words such as *encourage*, *value*, *specially*, *develop* and *good*:

‘The stream is a valued asset to the ecology of the Ulverscroft valley and the Lea Meadows nature reserve in particular. It is a very clean stream and consequently has good invertebrate fauna.’ (lrwt.org.uk)

There was one negative use but this may be a misuse, as *overgrowth* is more likely to refer to *flora*:
‘Conclusions Does the chosen solution work as expected? Yes, although there are some problems with regard to the sighting of the transeivers. Vandalism and overgrowth of local fauna have both caused problems.’ (industry.becta.org.uk)

Main differences in specialised corpora: *Flora* and *invertebrate* are also salient collocates in the specialised corpora. There are many animal, plant and wildlife collocates, but these are all low frequency. Occurrences in government and public corpora are notably positive, with collocates such as *rich*, *exceptional* and *stunning*. Frequencies are not radically different, although the government corpus has the highest number of occurrences of *fauna* in the specialised corpora.

Wildlife

UKWaC: There are many salient collocates for this term, including *conserve*, *scenery*, *geology*, *habitat*, *conservation*, *sanctuary*, *landscape*, *flora*, *farmland*, *gardening* and *endangered*. There are also many collocates pertaining to specific habitats (*wetland*, *seashore*, *heathland* and *freshwater*). *Wildlife corridor* is a salient term, although it is even more salient in the specialised corpora. The 100 randomly selected citations are all very positive, or warn of impact on wildlife, indicating its great value:

‘EcoHomes considers a broad range of environmental concerns including climate change, resource use, impact on wildlife and quality of the internal environment as part of the assessment.’ (drumhsg.co.uk)

‘More generally, the Weald is significant for its dense cover of ancient woodlands, rich in wildlife, while the South Downs are noted for their flower-rich downland pastures.’
(lense.net.uk)

Main differences in specialised corpora: The specialised corpora share the collocates *corridor*, *conservation*, *endangered*, *habitat*, *tourism*, *landscape* and *people* to a greater or lesser degree of salience. Collocates which are specific to particular corpora include *forestry* and *amenity* in the academic corpus; *help*, *encourage*, *value*, *friendly* (*wildlife friendly*) and *legislation* in the government

corpus; and *bird* in both the government and the public corpora. In the public corpus, *threaten* is salient, and so is *crime*, although all the occurrences of *wildlife crime* are from RSPB websites, for example:

‘Wildlife crime, long seen as “soft”, is now up there with the trade in drugs, weapons and people in terms of its significance and the way it operates.’ (rspb.org.uk)

The public and government corpora have similar frequencies, and the academic corpus has roughly a third as many citations as the other two specialised corpora.

Group 14. Vegetation and landscape

Flora

UKWaC: Fauna is a particularly salient collocate of *flora*, but other salient collocates include *native*, *intestinal gut* and *commensal*. These last three show the attention to medical issues in this corpus. Though not high salience, there are a large number of verbal collocates which demonstrate a positive outlook and responsibility towards *flora* e.g. *preserve*, *balance* and *protect*. The 100 random citations tend to be positive or neutral descriptions and many are from holiday sites:

‘The wetland flora and fauna is diverse and includes brooklime, skullcap, yellow iris, greater tussock-sedge and gypsywort.’ (wildlifetrust.org.uk)

‘On our first visit to Lesvos in the Spring of 1998 we were lucky enough to experience the flora and fauna as we journeyed from Myteline to Molyvos.’ (www.greekisland.co.uk)

‘Their friendly and helpful staff will be able to introduce you to the wealth of flora, birdlife and spectacular scenery and beaches, together with all the sailing, kayaking, fishing and golfing (to name only a very few) activities available.’ (stayinwales.co.uk)

Main differences in specialised corpora: The specialised corpora all have *fauna* and *ground* as salient collocates (*ground* is medium salience in the UKWaC). In the academic corpus *native* is salient, while in the government corpus there are many positive collocates such as *diverse*, *rich*, *characteristic* and also *support*, the latter demonstrating the government’s responsibility towards *flora*. The frequency pattern is similar to *fauna*. The government corpus has the highest proportion of the specialised corpora, and the public corpus has the lowest.

Vegetation

UKWaC: The most frequent and salient collocate is the positive adjective *lush*, with its connotations of abundance and life. *Lush vegetation* (sometimes *lush green vegetation*) is often used in descriptions of landscapes, gardens and travels. The other side of the lush fertility of vegetation is its decay: key phrases are *rotting/rotten vegetation* and *decaying/decayed vegetation*. There are mixed attitudes towards these: while there are negative references to, e.g., the ‘awful smell of decaying vegetation’, there are also neutral/positive references to rotten/decayed vegetation as a source of food for insects and a base of peat and compost. Another concept associated with vegetation is uncontrolled growth, with salient verb collocates including *encroach*, *swamp* and *dominate*. *Overgrown* is also salient, presenting an image of vegetation as something negative that needs to be managed or removed, for example:

‘The highway is maintained by Surrey County Council who have a duty to deal with road and pavement repairs, overgrown vegetation, broken drain covers, lamp posts...’
(surreyheath.gov.uk)

The negative connotations of *overgrown* are evident in its general use in UKWaC: key collocates include *litter-strewn*, *neglected* and *abandoned*. Related to this notion of uncontrolled growth is the verb collocate *clear*; there are frequent references to *clearing vegetation* in preparation for building and development.

Main differences in specialised corpora: *Vegetation* is most frequent in the academic corpus, where it is used in phrases such as *herbaceous/riparian vegetation* and *vegetation type/dynamics/cover*. In the government corpus, vegetation is described as *tall*, *aquatic*, *aesthetic* and *marginal*, whereas in the public corpus key adjective collocates are *sparse*, *dense* and *rank*.

Plant

Only noun citations were examined, as this part of speech is more relevant to this study. There are two main senses of plant: the botanical sense (relevant to this study) and the industrial sense. In what follows we consider the botanical sense.

UKWaC: Salient collocations relevant to the botanical sense are *grow, cultivate, shrub, flower, poisonous, hardy, dormant, bedding, medicinal, flowering, wild, exotic* and *native*. Many of these collocates suggest articles relating to gardening. Of 100 citations, the majority (80+%) are relevant to the botanical rather than the industrial sense, and these are typically objective and neutral facts, although there are also positive evaluative statements concerning beneficial aspects of plants, e.g.

‘The Sapi area is well known throughout Ladakh for its wealth of medicinal plants.’
(plantlife.org.uk)

‘A waterlogged area might be an ideal place to allow wetland plants to grow, providing valuable habitat for birds, insects and mammals.’ (cornwallriversproject.org.uk)

‘Nature is so cool. I have a mystery gourd plant I planted from seed taking over my back bed, the flowers havent been very spectacular but I anxiously await the “fruit”.’ (blue-witch.co.uk)

There were also two more negative citations; one on the safety of genetically modified food; and one on invasive plants:

‘The recent FAO WHO report, on safety aspects of genetically modified foods of plant origin, recognised the merits.’ (archive.food.gov.uk)

‘This is a particularly invasive plant capable of setting large seed numbers.’
(organicgardening.org.uk)

Main differences in specialised corpora: *Plant* occurs with similar frequency in all of the specialised corpora. Although there are several salient collocates in common, e.g. *animal, flowering, vascular, invasive* and *medicinal*, the academic corpus also has *protect, community, genomics* and several more technical terms including *macrofossils, ecophysiology* and *biomass*. In contrast, a salient collocate in the public and government corpora is *cultivate*, which is not salient in the academic corpus. The government corpus has a stronger salience for *arable* (which was not detected at even medium salience in the academic corpus) and is the only corpus in which *scarce* is a salient collocate.

Wetland

UKWaC: Salient collocations are *drain, grassland, heathland, habitat, ecosystem, floodplain, freshwater, coastal* and *lowland*. On inspection of a random sample of 100 citations, the vast majority were positive, presenting wetlands as an important and valuable habitat. However, there was one citation referring to issues related to farming and small holdings:

‘Phiri’s early attempts to farm the wetlands led to repeated fines, until he invited a judge to come and see if his work was really doing the damage it was accused of. Phiri was imprisoned and tortured for years...’ (new-agri.co.uk)

There was also one contentious citation:

‘a bunch of nature conservationists who have been sitting on the sidelines watching through their binoculars will suddenly leap in and declare that the restored canal is to be preserved as an “important habitat for wetland flora and fauna”, but that the same crowd will leap in and declare that it is to be preserved as an “important habitat for desert flora and fauna”.’ (mike-stevens.co.uk)

Main differences in specialised corpora: The public corpus has similar collocates as those in UKWaC (*drain, restore, coastal* and *habitat*). The academic and government corpora have fewer salient collocates overall, but particularly salient are *manage* and *management*. *Wetland* is twice as frequent in the government corpus as in the academic and public corpora.

Freshwater

UKWaC: Salient collocations are *marine, seawater, fishery, mussel* and *pearl*; *mussel* and *pearl* often co-occur in *freshwater pearl mussel*. In 100 random citations, most occurrences were neutral, though there were many positive, e.g.

‘A walk up the creek next to camp yields several discoveries: a side trail that leads to a hidden cove and an ancient village site, freshwater pools bordered by wildflowers that invite bathers, and a long abandoned hermits cabin hidden in the forest.’ (muirstours.org.uk)

‘Conserving freshwater ecosystems is not some lofty goal preached by the environmental movement but a practical and vital building block for eradicating poverty.’ (wwf.org.uk)

Main differences in specialised corpora: The specialised corpora shared many collocates in common with UKWaC, though *pearl* and *mussel* were found only in the government corpus.

Woodland

UKWaC: There are many salient collocates including *scrub, grassland, hedgerow, meadow, farmland, parkland, semi-natural, deciduous, broadleaved, ancient, coniferous* and *glade*. The 100 randomly-selected citations were primarily neutral descriptions, but there were a number of positive references and nothing negative:

‘Magnificent ancient woodland in quiet corner of Suffolk coast opens to public.’
(suffolkwildlife.co.uk)

‘It has a refreshing and straightforward approach to getting the best out of your woodland and, most importantly,’
(woodland-trust.org.uk)

Main differences in specialised corpora: The specialised corpora contain similar collocates to UKWaC but with the following differences. *Miombo* is salient (though low frequency) in the academic corpus, but not observed in government or public corpora. Meanwhile, *heritage* is a salient collocate in the public corpus, as are *society, experience, enhance* and *enjoy*, which highlight the aesthetics and value of woodlands. *Woodland* is over four times as frequent in the public and government corpora as in the academic corpus.

Hedgerow

UKWaC: *Hedgerow* is fairly low frequency, with only 0.035 occurrences per 10,000 words. Salient collocates include *species-rich, woodland, copse* and the somewhat negative *overgrown*. The 100 random citations showed a positive or neutral attitude towards the term, although there were also many citations highlighting concern over loss or neglect e.g.

‘Only half the length of hedgerow present in Britain in 1945 was still present in 1990. Not only has this removed the physical boundaries, but also the strip of less-intensively farmed land alongside the boundary where the more diverse flora can survive.’ (fieldguide.co.uk)

Main differences in specialised corpora: The public and academic corpora have too few occurrences to reliably detect salient collocations, but the government has between four and five times the frequency of the other two corpora. Collocates in the government corpus include *species-rich, wall* (in the phrase *stone wall*), *remove* and *restoration*, though the latter is low frequency.

Forest

UKWaC: Salient collocates include *pine, tropical, ecosystem, mangrove, enchanted, well-managed, woodland* and *grassland*. The 100 random citations were all positive or neutral descriptions, though there was one reference to destruction:

‘Armed with bows, arrows and spears, nearly 100 Indians from the Brazilian tribe of Kayapo recently captured and held hostage a gold prospector for invading and destroying their forests in the northern state of Para.’ (developments.org.uk)

Main differences in specialised corpora: The specialised corpora had many similar collocates relating to protection (*protect, destroy, preserve, manage*) and types of habitat (*grassland, savannah, tropical*). There were some collocates specific to particular corpora: the technical collocate *biome* in the academic corpus; *livelihood* in the public corpus; and *operation* and *resource* in the government corpus.

Deforestation

UkWaC: Salient collocations are *desertification, Amazonian, over-fishing, overgrazing, reforestation* and *afforestation*. Another collocate is *over-population*, though this has mid-salience and low frequency. Of a random sample of 100 citations, all were negative, with a mixture of evaluative judgements and objective facts. In many cases it was hard to separate the two as facts were being used to express opinions, e.g.

‘Deforestation: this is a growing problem in Nepal, which is exacerbated by the influx of Western trekkers.’ (isbuc.co.uk)

‘Like all such disasters it arose partly from nature but partly also from politics, from deforestation, from the legacy of corruption and from poverty.’ (redflag.org.uk)

‘At the same time, there are genuine concerns about the rate of deforestation and loss of biodiversity in tropical forests as well as the recognition that illegal logging does little to help the economic development of communities living in the forests.’ (manifest.co.uk)

Main differences in specialised corpora: *Deforestation* is least frequent in the government corpus, it is over five times as frequent in the academic as in the government corpus, and over seven times as frequent in the public as in the government corpus. The collocations are similar, though the academic and government corpora have the more technical collocate *desertification*. In both the academic and public corpora, *halt* and *avoid* are salient, while in the academic corpus *controlling* is also salient, and in the public corpus *stop* is salient.

Rainforest

UkWaC: Salient collocates include positive descriptive collocates such as *tropical, Amazonian, lowland, savannah* and *lush*. There are also negative collocates – *trash* and *plunder* – highlighting the prevalent concern with the destruction of rainforests. The 100 random citations contained many positive references, with adjectives such as *precious* and *lush*, and neutral descriptions. There were also many concerns over destruction:

‘The rainforests of Indonesia are among the most threatened in the world.’ (foe.co.uk)

The only negative description was used with reference to the unsuitability of rainforests for farming:

‘The thin soil of the rainforest, especially once the trees have been removed, is very poor and will not yield good crops or even grassland for cattle ranching.’ (belfastzoo.co.uk)

Main differences in specialised corpora: *Rainforest* is least frequent in the government corpus, and is over seven times as frequent in the academic as in the government corpus, and ten times as frequent in the public as in the government corpus. *Tropical* is a salient collocate in all the corpora, but the academic corpus also has the more technical term *Neotropical*. *Save* is more salient in the government corpus, indicating more focus on action to be taken. The public corpus meanwhile has a greater number of collocates concerned with destruction (*destroy, destruction*), though also *preserve*. The public corpus also has *timber* and *tree* as salient collocates, indicating the public concern about logging.

Grassland

UKWaC: Salient collocates include many types of habitat (*scrub, heathland* and *woodland*) as well as the verb *graze*. There are also collocates for many specific types of grassland, notably *unimproved, calcareous, acid* and *chalk*. The 100 random citations were positive or neutral as regards *grassland*, though there were some warnings of loss:

‘Grassland is the most threatened habitat in Gloucestershire. We have lost 97 % of our grassland habitat over the last 40 years - so please help us save the last remnant areas of wildlife-rich grassland we have.’ (gloucestershirewildlifetrust.co.uk)

Main differences in specialised corpora: The salient collocates were similar to UKWaC, though the government corpus also had *dry* (and *wet*, but with medium salience) and collocates such as *enclose, manage* and *improve*, due to the government role in management. *Wet* and *improve* were also salient in the public corpus. There were four times as many occurrences of *grassland* in the government corpus compared to the other two corpora.

Heathland

UKWaC: Salient collocates include other related types of habitat (*grassland, downland* and *moorland*). Of 100 randomly-selected citations, the majority were neutral or positive descriptions, but with many instances relating to the disappearance of heathland:

‘This coastal heathland is now very rare in Hampshire, so the fenced areas are grazed to stop bushes and bracken from spreading over the whole common.’ (hants.gov.uk)

‘Lowland heathland is a scarce wildlife habitat which supports rare plants such as the Cornish heath and scarce animals such as the southern damselfly, smooth snake, natterjack toad nightjar and woodlark.’ (english-nature.co.uk)

Main differences in specialised corpora: *Heathland* is seven times as frequent in the government as in the academic corpus, and four times as frequent in the government as in the public corpus. The government corpus had higher salience of collocates related to re-creation (*re-create, restoration* and *reinstate*).

Savanna(h)

UKWaC: Key phrases include *grassy/bush/wooded/arid/African savanna(h); savanna(h) thicket/habitat/grassland/plain/wetland/woodland/sparrow/ecosystem; and roam/cruise/inhabit the savannah*. Of a random sample of 100 citations, most were neutral and objective descriptions of the savannah, or statements about the savannah as a habitat. A couple were extended or literary usages: ‘savannah beige’ (justkampers.co.uk, describing the colour of a van) and ‘Bori’s savannah broad heart’ (sentinelpoetry.org.uk). Several citations were more subjective statements in tourism websites which used the word *savannah* to conjure up space and beauty:

‘An absolute must visit on a career break in Kenya is the world renowned Maasai Mara game reserve a vast and idyllic savannah dotted with acacia trees and teeming with a diverse range of incredible wildlife.’ (gapyearforgrownups.co.uk)

‘When you add to this the vast cloud forests, the endless savannah wetlands of the Llanos, the dramatic scenery of the high Andes ...the fine hotels and the excellent food, Venezuela becomes the obvious choice for a birding trip to the South American continent.’ (birdtours.co.uk)

Main differences in specialised corpora: In UKWaC and the public corpus, *savannah* is slightly more frequent than *savanna*, and in the government corpus, *savannah* is the only form. In the academic corpus, on the other hand, *savanna* is more frequent. In all three, the word is used descriptively and objectively.

Desert

UKWaC: Key phrases include *desert island*, *arid/barren/stony desert*, *Arabian/Syrian desert* and *scorching/encroaching/unforgiving desert*. A random sample of 100 citations (of which a few were misspellings of *dessert*) indicated that *desert* is often used negatively, frequently connoting harshness and barrenness, and contrasted unfavourably with forests:

‘The lush moist forests, brimming with life, contrast strongly with the barren baking deserts and the freezing wastelands of the poles.’ (sciencenet.org.uk)

‘Why should they care if the whole world is turned into a radiation soaked desert?’ (thebikezone.org.uk)

In only one case was *desert* used with positive connotations, in a tourism website, but it is in the phrase *desert city*, thus tempering the sparseness of the desert with the amenities of urban areas:

‘Arizona, the name itself inspires images of sundrenched desert cities, spas and dazzling resorts.’ (visitusa.org.uk)

Main differences in specialised corpora: *Desert* is relatively infrequent in the government corpus, and occurs in both neutral statements and negative citations such as ‘Are our ponds wildlife havens or deserts? Are they polluted or pristine?’ (biodiversityscotland.gov.uk). The citations in the academic corpus are all objective descriptions, while the public corpus contains some positive citations, e.g.

‘...a multitude of wildlife species that make the Chihuahuan Desert the third richest desert in biodiversity.’ (wwf.org.uk)

Reef

UKWaC: By far the most frequent collocate is *coral*; other key phrases include *pristine reef*, *artificial reef*, *fringing reef*, *dive a reef*, *reef shark* and *reef teeming with fish/life*. Of a random sample of 100 citations, a few referred to damage and erosion of reefs, for example:

‘The quality of the reefs and wrecks, have undoubtedly suffered some deterioration from the sheer volume of divers that visit these sites...’ (bsatravelclub.co.uk)

The majority, however, were positive descriptions of reefs, often in context of diving, and often in tourism websites, e.g.

‘This area offers some of the best diving in the world, with dramatic walls, resplendent reefs, abundant marine life, and astonishing visibility.’ (caymanislands.co.uk)

Main differences in specialised corpora: In all three corpora, the most salient phrase is *coral reef*, and there are frequent references to the impact of both tourism and climate change on coral reefs. In the public corpus, *rainforest* is also a salient collocate, and there are comparisons of these two types of ecosystem, e.g. ‘Coral reefs and rainforests are possibly the most diverse and important on the planet’ (bbc.co.uk).

Ocean

UKWaC: Key phrases include *ocean liner*, *ocean current*, *Atlantic/Pacific/Indian Ocean* and *boundless/deep ocean*. Of a random sample of 100 citations, most were neutral descriptions, and there were also two positive uses of the phrase ‘ocean view’ to promote holiday villas. Five citations were of the figurative phrase ‘an ocean of...’ meaning ‘an expanse of...’, e.g. ‘the supermarket, an ocean of modularized substance where everything in sight is meant only to be consumed, destroyed, wasted...’ (blueyonder.co.uk).

Main differences in specialised corpora: A key phrase in the public and academic corpora, but not in the government corpus, is *ocean acidification*. In the government, a salient collocate is *sea*, for example in ‘Vision for the UK marine environment: “Clean, healthy, safe, productive and biologically diverse oceans and seas”’ (jncc.gov.uk).

Aquatic

UKWaC: *Aquatic* modifies *invertebrate*, *ecosystem*, *colloid* and *macrophytes*, and also collocates with *terrestrial* and *semi-aquatic*. Of a random sample of 100 citations, a few referred to human use of water (*aquatic amusement park*, *aquatic sports*, and *aquatic pursuits*), but most referred to water as a habitat (*aquatic life*, *environment*, *creatures*, *animals*, *species* and *wildlife*). About 10% referred to the pollution or contamination of aquatic environments, or loss of aquatic habitats, and the rest were neutral descriptions.

Main differences in specialised corpora: *Aquatic* is about twice as frequent in the academic corpus as in either the government or public corpus. In the academic corpus its most salient collocates are *terrestrial* and *ecosystem*.

Terrestrial

UKWaC: There are three main senses of *terrestrial* indicated by the collocates in UKWaC: existing on the earth, as opposed to sea or sky (*terrestrial ecosystem/biosphere/invertebrate*); broadcast without satellites (*terrestrial broadcaster/channel/television*), and, less frequently, relating to earth, as opposed to other planets (e.g. *terrestrial zodiac*). Of a random sample of 100, 50 related to television and four related to earth in contrast to space. The rest referred to land-based ecosystems, and most of these were objective statements from academic websites, e.g. ‘Arbuscular mycorrhizal (AM) fungi are key components of terrestrial ecosystems’ (macauley.ac.uk).

Main differences in specialised corpora: *Terrestrial* is over three times as frequent in the academic corpus as in the other two corpora. In all three, *terrestrial* frequently occurs in combination with *aquatic*, *marine* or *freshwater*, for example ‘marine, terrestrial and freshwater species’ and ‘freshwater and terrestrial habitats’.

Coastal

UKWaC: *Coastal* modifies *erosion*, *plain*, *resort*, *scenery* and (*foot*)*path*. In a random sample of 100 citations, there were four instances of *coastal erosion* and five of *coastal defence(s)*. Several citations referred to the importance of coastal regions for humans, e.g.

‘a strategic assessment of all of Scotland’s coastal and marine environment in terms of its importance for natural heritage, historic environment and enjoyment and recreation.’ (snh.org.uk)

‘The importance of coastal zones to the tourism industry and the need to protect such resources is not only vital to the economy of nations but presents a growing dilemma for many localities and regions.’ (wmin.ac.uk)

Main differences in specialised corpora: In the public and government corpora, the key collocates are *defence* and *squeeze*, for example:

‘The main threats are from coastal development, flood defence works and the impact of climate change resulting in “coastal squeeze”’. (rspb.org.uk)

(Several of the citations with ‘coastal squeeze’ are in inverted commas, indicating that it is a relatively new term.) These phrases are much rarer in the academic corpus, where instead the most salient phrases are *coastal zone* and *coastal management*.

Marine

UKWaC: Salient collocates include *mammal*, *biologist*, *ecosystem*, *organism*, *environment* and *biology*. Of a random sample of 100 citations, most were neutral, with a few references to the importance of the marine environment and marine species, e.g. ‘Marine conservation is a matter of global priority and utmost urgency’ (patp3.webbler.co.uk).

Main differences in specialised corpora: *Marine* is most frequent in the academic corpus, where a key phrase is *marine reserve*. (*Marine reserve* is infrequent in the government and public corpora.) In all three the most salient phrase is *the marine environment*.

Soil

UKWaC: Key phrases include *soil erosion/fertility/moisture; fertile/sandy/drained/well-drained/moist/acidic soil; clay soil* and *cultivate soil*. Of a random sample of 100 citations, six were of the transferred sense ‘country, region’ (e.g. ‘on British soil’), and the rest were neutral descriptions of types of soil or ways to cultivate soil, particularly in advice about gardening.

Main differences in specialised corpora: In all three corpora, the most salient phrase is *soil erosion*, frequently with reference to flooding and habitat loss. In the academic corpus, most citations with *soil erosion* were neutral references to measurement of erosion, while in the government and public corpora there were references to preventing erosion, and to the causes of erosion (including global warming, poor farming practices and motorcycle use).

Wilderness

UKWaC: Salient collocates include *howling, overgrown, pristine, Alaskan, untamed, untouched and unspoilt*. A random sample of 100 citations showed that *wilderness* has mainly positive connotations of space and escape, and is used promotionally, e.g.

‘...get close up to Alaska’s glaciers and whales on our small-ship adventure cruise... Here towering glaciers meet pristine wilderness and mighty spruce trees vie for space next to majestic fjords...’ (cruisingholidays.co.uk)

However, in a few cases *wilderness* is used in a negative way to describe neglect, e.g.

‘They... allowed the grass and weeds to have their own way, till the whole domain became little better than an unsightly wilderness.’ (athelstane.co.uk)

There are also a few instances of the figurative sense relating to a period of time when something is less popular or successful – for example ‘Carnivorism is back, after years in the wilderness...’ – picking up on the negative associations of something which is untended. There are also several biblical paraphrases and quotations.

Main differences in specialised corpora: *Wilderness* is over three times as frequent in the academic as in the public corpus, and nearly three times as frequent in the academic as in the government corpus. In the academic corpus, it often occurs in discussions of the concept of wilderness, e.g.

‘Large tracts of Northern Canada are still considered wild, though the Western concept of wilderness has evolved from a need to transform and tame the land, to a wish to preserve it.’ (leeds.ac.uk)

In the public and government corpora, *wilderness* is positive, with references to protecting, enjoying, and ‘feeling a sense of’ wilderness. However, there is recognition of negative perceptions:

‘...selling the ideas [of wild spaces in cities] will be challenging in many communities where “wilderness” is still a negative concept.’ (wwf.org.uk)

Topography

UKWaC: Salient adjective modifiers include *underwater, undulating, corneal* and *rugged*, and *geology* is also a strong collocate. Of a random sample of 100 citations, all were objective statements from a variety of sources including academic websites, book titles, and history and art sites. There were also some figurative uses, e.g. ‘a main index screen shows the basic topography of the module’ ‘a conceptual topography of learning’, and ‘the gendered “spiritual topography” of Naples’.

Main differences in specialised corpora: *Topography* is more frequent in the government corpus than in the public or academic corpora, and often refers to the effect of topography on planning and development, e.g.

‘Devon’s topography does not lend itself to the natural development of large fresh water reedbeds.’ (devon.gov.uk)

In the public corpus, there are positive associations with undulating and varied topographies, and negative associations with uniform ones:

‘A varied topography is likely to deliver a richer habitat mosaic.’ (rspb.org.uk)

‘The development site currently has a character typical of a landscape blighted by agricultural degradation and urban encroachment. Its topography is largely uniform, and the site lacks structural composition and visual diversity.’ (nationaltrust.org.uk)

**Countryside*

UKWaC: *Countryside* is modified by *surrounding, unspoilt, undulating, rolling, beautiful, lush, glorious* and *picturesque*. It also collocates with *coastline, coast* and *wildlife*, and is used in the phrases *countryside ranger, countryside stewardship* and *countryside recreation*. Of a random sample of 100 citations, almost all were positive references to enjoying beautiful, unspoilt and scenic countryside, sometimes as a selling-point, e.g. ‘get away from it all into the Scottish countryside’ (holiday-cottages-scotland.co.uk). There are also concerns about preserving the countryside, and ‘the crisis in the countryside and the decline in farming’ (edp24.co.uk). A couple of citations imply slightly negative connotations of isolation and fear, e.g.

‘British Telecom intends to cull over 3,000 rural telephone boxes, a situation that the Ramblers’ Association claims could lead to increased safety fears for visitors to the countryside.’ (ramblers.org.uk)

Comparison with other words in UKWaC: The word that is used most similarly to *countryside* is *landscape*. Both are described as *breathtaking, lush, rich, beautiful, picturesque*, etc., and there are equally salient references to *conserving, protecting, exploring* and *enjoying* both *countryside* and *landscape*. However, *countryside* has more significant collocation with the positive adjectives *unspoilt, unspoiled, glorious* and *ideal*, whereas *landscape* has a few more negative collocates such as *barren, bleak* and *scarred*, which either do not occur at all with *countryside*, or occur very rarely. This again highlights the very positive connotations of *countryside*.

Main differences in specialised corpora: A key phrase in the public and government corpora is *the wider countryside*, in contrast with protected areas, e.g. ‘so that wildlife can survive in the wider countryside outside nature reserves’ (cambridgeshire.gov.uk). (*The wider countryside* also occurs in the academic corpus, but mainly in just one website.)

Landscape

UKWaC: Key phrases include *urban/historic/rural/rugged landscape, landscape architect/gardener/painter* and *karst/desert landscape*. Of a random sample of 100 citations, there were several instances of the ‘painting’ sense (for example, ‘a prominent painter of lyrical landscapes’) and some of the extended sense ‘features, characteristics’ (e.g. ‘the English cultural landscape’). Most, though, were of the physical sense ‘area of land’, and while there were two of ‘industrial(ised) landscape’, most referred to rural landscape and presented this in a positive way, for example as *magnificent* and *beautiful*. Indeed, *landscape* without a modifier is taken to mean ‘rural landscape/the countryside’, e.g.:

‘How do you spoil yourself? Immersion in landscape/weather/walking and exercise followed by good food and alcohol.’ (penguin.co.uk)

Main differences in specialised corpora: *Landscape* is particularly frequent in the government corpus. A key phrase is *landscape character*, which is about ten times more frequent in the government corpus than in the academic or public corpora, in citations such as:

‘To conserve & enhance distinctive landscape character, scenic value and visual amenity of the area.’ (orkney.gov.uk)

Group 15. Agriculture

Agriculture and agricultural

UKWaC: Salient collocates of *agriculture* include *sustainable, intensive, organic, subsistence, irrigated* and *industrialized*. *Agricultural* modifies *labourer, biotechnology, subsidy* and *land*. In a sample of 100 citations of *agriculture* and 100 of *agricultural*, various concerns were voiced both about the problems that agriculture is facing, e.g. –

‘In the meantime the strength of the pound has contributed largely to current problems in agriculture...’ (northdevon.gov.uk)

– and the problems it causes, e.g.

‘Conventional agriculture devastates biodiversity, through monoculture practices, pesticide usage, etc.’ (betterthinking.co.uk)

‘Extreme deforestation rates on agricultural land have reduced the biodiversity of natural vegetation and wildlife to a low level.’ (mountain-portal.co.uk)

Attitudes also depend on the kind of agriculture being discussed, and there are several citations extolling the benefits of *sustainable, organic, low-intensity* and *traditional agriculture*, e.g.

‘Traditional agriculture has developed over 10,000 years in tune with the complexities of nature.’ (christian-ecology.org.uk)

Main differences in specialised corpora: Both *agriculture* and *agricultural* are slightly more frequent in the academic corpus than in the government or public corpora. In all three, *intensive* and *sustainable* are salient modifiers of *agriculture*, while in the academic corpus *modern* is also salient, e.g. in ‘Modern agriculture has changed the character of the arable ecosystem’ (rdg.ac.uk). The phrase *agricultural intensification* is salient in all three, while *agricultural improvement* is particularly frequent in the government corpus (between five and ten times more frequent than in the other two). Despite the usually positive connotations of *improvement*, the phrase is used negatively to describe problems caused by developments, e.g.

‘The decline [in the chough population] is thought to be related to a lack of suitable feeding habitat mainly due to agricultural improvement and changes in livestock farming practise [sic].’ (dardni.gov.uk)

Farmland

UKWaC: Key phrases include *farmland bird/wildlife/biodiversity/habitat* and *arable/fertile/lowland/rolling/undulating farmland*. Unlike *agriculture*, *farmland* has positive connotations, and is used promotionally in tourism and real estate websites:

‘A delightful 19th Century barn conversion, situated within 250 acres of farmland, in the scenic Hope Valley.’ (skyescottages.co.uk)

‘Overbridge Barn is a well-presented detached period barn set in the heart of the Kent countryside overlooking the Weald and farmland.’ (exclusivehomes.co.uk)

There are also references to the protection of farmland birds, species and wildlife, and fears that farmland is being replaced by less desirable urban developments:

‘Their [residents’] major concerns are: Loss of farmland Loss of character Traffic increases...’ (noheslingtoneast.co.uk)

Main differences in specialised corpora: In all three, *farmland bird* is the most salient phrase, occurring in citations relating to both the loss and the protection of farmland birds.

Fishery

UKWaC: Key phrases include *freshwater fishery, stocked/well-stocked fishery, trawl fishery, trout/herring/salmon fishery, inshore/deep-water fishery* and *fishery management*. Salient verbs following *fishery* include *target, collapse* and *decline*. A random sample of 100 citations showed that most were neutral references, with a few voicing concerns about the protection or destruction of fisheries, e.g.

‘Climate Change is already affecting agriculture and fisheries even in Scotland.’
(cfdnetwork.co.uk)

Main differences in specialised corpora: In all three corpora salient collocates are *commercial* and *sustainable*, and in the public corpus there are also several references (all from RSPB websites) to *industrial fisheries* and whether or not these are sustainable.

Group 16. Economics and politics

Resource

UKWaC: Key phrases include *allocate/access resources*, *available/scarce/finite/limited resources*, *natural/valuable/electronic resources* and *Internet/learning resources*. A random sample of 100 citations showed three main senses of *resources*: things that people use to help them do something (e.g. ‘educational resources’, ‘a resource centre’); money, personnel etc. that a business uses (‘proposals rejected because of lack of resources’, ‘planning and resource management’); and the materials in nature that people use and see as valuable (e.g. ‘Iraq’s vast oil resources’). The first and second sense are the most frequent, and there were only seven instances of the ‘natural materials’ sense, referring to how these are used, e.g.

‘Extractive reserves are protected areas designated for the sustainable use of natural resources by the resident population.’ (uea.ac.uk)

‘The natural resources of North Wales have been used to generate electricity for both national and local demand for over 90 years.’ (eyri-npa.co.uk)

Main differences in specialised corpora: In all three, the main sense of *resource* is ‘materials in nature’, as can be seen by the salient phrases *natural resources*, *water resources* and *conserve/manage resources*. *Resource* is almost twice as frequent in the academic corpus as in the public and government corpora,

Economy and economic

UKWaC: Salient modifiers include *global*, *rural*, *knowledge-based* and *political*; another key phrase is *boost the economy*, and the economy is described as *slowing*, *collapsing* or *growing*. *Economic* collocates with *social*, *political*, *environmental*, *growth* and *prosperity*, and also with *purely*, for example ‘in purely economic terms...’ Of a random sample of 100 citations with *economy* and 100 with *economic*, most were neutral statements, or concerns about the economic downturn, and a few also linked the economy and the environment, e.g.

‘Dispersed biomass generation and the cultivation of crops would bring jobs to remote regions and benefits to local economies, in addition to environmental benefits.’ (earthscan.co.uk)

‘...the proposed Hastings Bypasses were turned down because of environmental damage and no clear economic benefits, but other roads and public transport schemes were agreed.’
(transport2000.org.uk)

‘Economic gains require accompanying environmental and social gain.’ (planet-thanet.fsnet.org.uk)

Main differences in specialised corpora: *Economy* is approximately twice as frequent in the public corpus as in the government and academic corpora, whereas *economic* is slightly more frequent in the academic corpus than in the other two. In the academic corpus, the most salient modifier of *economy* is *political*, but in the public and government corpora the main concerns are with the *rural* and *local economy*. In the public corpus, the phrase *economic crisis* is salient, and there are arguments linking environmental action with addressing economic problems:

‘Those who claim we should be focussing solely on the economic crisis are missing the point somewhat – “green” jobs in the US are likely to be one of the few things that actually helps the economy.’ (bbc.co.uk)

‘...the electricity regulator Ofgem released a study showing that the best way to secure Britain’s energy future while minimizing price rises for consumers is to invest in renewables and energy efficiency. The solutions to the economic crisis and the climate crisis are the same.’ (greenpeace.org.uk)

Natural capital

UKWaC: Over 30% of the occurrences of *natural capital* in UKWaC (excluding those where it is part of a book title) present it in inverted commas, with a following explanation, or in a context referring to the concept itself:

‘Australia is more frugal, and the US consumes “natural capital” at about the average rate for a country of its wealth and land ratio.’

‘...natural capital (oils and minerals, fisheries, forests and more broadly, ecosystems)...’

‘...the value of the natural capital concept as an analytical framework for economic policy...’

‘The common individual has to be told in clear and simple terms what is meant by natural capital...’

This suggests that the phrase is not fully integrated into the language. The remaining occurrences, where *natural capital* is used in a non-self-referential way, frequently relate to amount, for example the *stock*, *loss* and *depletion* of natural capital.

Main differences in specialised corpora: *Natural capital* is used in the academic corpus mainly in book and article titles, and in the government corpus mainly in descriptive statements such as ‘Nearly 70% of natural capital in low income countries is agricultural land’ (hm-treasury.gov.uk). In the public corpus there are more arguments about the importance of natural capital, e.g.:

‘Unless we begin to value this natural capital in exactly the same way we value human or social capital, we will not begin to tackle the problem. Isn’t it ironic that the UK has a treasury department that spends most of its time talking about over-leveraging in the financial system and credit bubbles, but cannot see the connection with a world that every year consumes resources that it takes the planet one year and four months to renew or replace?’ (bbc.co.uk)

Politics

UKWaC: Salient modifiers of *politics* include *electoral*, *British*, *comparative*, *radical*, *democratic*, *identity*, *adversarial* and *gender*. Other collocates are *economics*, *sociology* and *religion*. Of a random sample of 100 citations, most were neutral uses of the sense ‘the study or business of having power over a country’, for example ‘major figures in European politics’, ‘a degree in politics’, with the occasional positive use of this sense, e.g.

‘Politics and leadership are about changing things, not merely going with the flow.’ (cer.org.uk)

A few citations were of the sense ‘a person’s political opinions’, e.g. ‘I don’t like his politics’. There were also some negative uses of the sense ‘individual interests, doing things for one’s own ends’, e.g.

‘Ignorance, vested interests and politics aside, do you think the world could ever be powered 100% by renewable energy?’ (chickenshack.co.uk)

‘The internal politics continued throughout 1917-18 and it became apparent that the in-fighting was having a serious impact on the club’s well-being.’ (mightyleeds.co.uk)

Main differences in specialised corpora: *Politics* is relatively infrequent in all three corpora, with most of the citations coming from book and project titles (in the academic corpus) and from news website headers (in the public corpus). Of the remaining citations, *politics* is used neutrally and sometimes positively in the government corpus, e.g.

‘...raising awareness, campaigning, institutional change, and politics have achieved a great deal for the natural environment in recent years . (defra.gov.uk)

In the academic and public corpora, however, there are several more negative uses of the term, where *politics* is perceived as a hindrance to environmental action:

‘This level needs to be engaged with parallel marine planning process in the UK and not resort to politics over boundary delimitation.’ (sams.ac.uk)

‘Such measures are unacceptable to our blinkered politicians, who will continue with “business as usual” politics until global heating and mass extinctions makes large areas of the earth uninhabitable for humans.’ (bbc.co.uk)

‘Away from politics, we work on the ground in vulnerable regions to protect wildlife, habitats and poor communities and to help them cope with the impacts of climate change.’ (wwf.org.uk)

Group 17. Science

Geology

UKWaC: *Geology* modifies *textbook*, *undergraduate* and *professor*, and is modified by *bedrock*, *petroleum* and *Quaternary*. Other collocates include *geomorphology*, *mineralogy* and *geophysics*. Most of the random sample of 100 citations were objective statements relating to the study of geology, with a few more subjective and personal uses, e.g.

‘The geology is spectacular, best seen from a round-the-island boat trip.’ (atm.ox.ac.uk)

Main differences in specialised corpora: *Geology* is more frequent in the government corpus than in the other two specialised corpora, occurring mainly in neutral descriptions, with some positive references to the value and importance of geology, e.g.

‘The environment underpins everything we do. The geology and the soil determine the types of crop that can grow and where it is grown, providing mankind with the foodstuffs necessary for survival.’ (oadby-wigston.gov.uk)

‘The County’s geology is a valuable economic resource in its own right, as a source of aggregate, clays for ceramics and manufacturing and as a source of source of building and decorative stone.’ (devon.gov.uk)

Biology and biological

UKWaC: Key phrases include *molecular/cell/evolutionary/stem cell biology* and *study/teach/understand biology*; other collocates include *biochemistry*, *chemistry* and *genetics*. The randomly-sampled 100 citations were all neutral, mostly about the study of biology. The strongest collocate of *biological* is *weapon*, with other collocates relating to war, including *warfare*, *chemical* and *nuclear*. Other phrases include *biological diversity* and *biological clock*. Of a random sample of 100 citations, most were neutral, although a few citations indicated the occasional use of *biological* to mean ‘natural, inherent’ (and therefore, by implication, unavoidable):

‘Religion is therefore more likely to be a cultural phenomenon than a biological one as some people try to persuade themselves.’ (askwhy.co.uk)

‘African-Americans, Jews, people with disabilities as well as homosexuals have been and still are persecuted for biological “flaws”’. (thecornerhouse.org.uk)

Main differences in specialised corpora: *Biology* is over six times more frequent in the academic corpus than in the government and public corpora, and strong collocates are *evolutionary*, *ecology* and *chemistry*. As in UKWaC, it is used in objective statements about the study and understanding of biology. In all three corpora, the most salient collocate of *biological* is *diversity*. In the academic and public corpora, but not in the government corpus, *biological control* is also a salient phrase, and raises more subjective comments, e.g.

‘Biological control is often viewed in a negative light as many people hold the view that the introduction of a species into an ecosystem holds so many potential problems that they can’t all be regulated for ... However to state that is a norm or even that there is a remote danger to the ecosystems of the UK can only be said in ignorance of the facts.’ (bbc.co.uk; reader’s comment)

Biogeography

UKWaC: *Biogeography* is too infrequent in UKWaC for salient collocates to be identified. The randomly-sampled 100 citations were all neutral, mostly in journal, book and course titles.

Main differences in specialised corpora: *Biogeography* is most frequent in the academic corpus. In all three, it occurs mainly in titles and headings, and is rarely used in natural language.

Natural history

UKWaC: Of a random sample of 100 citations, the majority related to *natural history* in the sense ‘the study of living things’ (although there were a few citations referring to the history of any topic, e.g. ‘the natural history of the cold sore’). A third were of the phrase *natural history museum* or *museum of natural history*, and the rest were mainly neutral references to clubs, societies and books, or to interest in or study of natural history, with some positive and promotional uses of the term, e.g.

‘Holiday rentals in Istria offer the perfect chance for you to discover an ancient country rich in natural history and culture.’ (ownersdirect.co.uk)

Main differences in specialised corpora: In all three corpora, *natural history* is most frequently used in titles, especially *natural history museum* and *natural history society*.

Science

UKWaC: Salient modifiers indicate types of science: *social, forensic, biological, biomedical, cognitive, computer, earth* and *rocket* (although the latter is almost always in the phrase ‘it’s not rocket science’). Salient verb collocates refer to the use and teaching of science: *study, advance, communicate* and *teach*. *Science fiction* is a key phrase, and other words that *science* modifies include *curriculum, laboratory* and *subject*. Of a random sample of 100 citations, most were neutral statements, although there were a few positive affirmations of the importance of science, perhaps reacting to negative public perceptions:

‘I should teach the world that science is not just something that boffins do. Central to all science is the notion of evidence, and objective reasoning. That has fundamental relevance to us all, and to the ways in which we choose to live.’ (spiked-online.co.uk)

‘The low take up of mathematical or science studies means majority of the society is still mathematically or scientifically illiterate and under-informed. In relation to this, increasing effort has been put into promoting a positive public image of science and the public understanding of science recently through various authorities’ (people.ex.ac.uk)

Main differences in specialised corpora: *Science* is most frequent in the academic corpus, less so in the public, and quite infrequent in the government corpus. Salient phrases in the academic corpus include *social science* and *earth science*. *Science base* is also salient, with references to the importance of scientific evidence, e.g.

‘Now, more than ever before, a robust science evidence base is required to underpin the process of evaluating different management options and to integrate the ecosystem approach into decision making.’ (pml.ac.uk)

In the public corpus, but not in the academic or government corpora, *climate science* is a key phrase, and we see again the issue of public scepticism about the climate change debate and the evidence on which it is based:

‘But if research is being skewed and distorted, we ought to know, because good climate science is the key to good climate policy. If it is not, then the most damaging accusation raised by the sceptical community will have been laid to rest.’ (bbc.co.uk)

Appendix. Corpus frequencies

Frequencies refer to all occurrences of a given word/phrase, unless stated otherwise: for example, the frequency of *change* includes both noun and verb forms, in all senses. If only one part of speech is relevant, this has been noted: for example, *desert (noun)* means that occurrences of the noun *desert* have been counted, but occurrences of the verb *desert* have not.

word/phrase	UkWAC			Academic		Government		Public	
	raw	per 10000		raw	per 10000	raw	per 10000	raw	per 10000
access	546780	3.493		698	4.317	1411	8.341	578	4.356
agricultural	49835	0.318		836	5.170	669	3.955	403	3.037
agriculture	41727	0.267		714	4.416	580	3.429	484	3.648
allotment	7984	0.051		5	0.031	85	0.502	19	0.143
amateur	21217	0.136		12	0.074	19	0.112	21	0.158
anxiety	28979	0.185		4	0.025	19	0.112	9	0.068
aquatic	6118	0.039		244	1.509	130	0.769	74	0.558
attachment	22764	0.145		9	0.056	1	0.006	1	0.008
beautiful	128863	0.823		20	0.124	47	0.278	85	0.641
beauty	61779	0.395		58	0.359	177	1.046	112	0.844
biodiversity	25858	0.165		3490	21.585	6129	36.233	2042	15.390
biogeography	480	0.003		93	0.575	27	0.160	15	0.113
biological	46599	0.298		876	5.418	712	4.209	364	2.743
biology	36596	0.234		612	3.785	100	0.591	76	0.573
biome	1311	0.008		211	1.305	25	0.148	38	0.286
biosphere	2005	0.013		143	0.884	21	0.124	54	0.407
biotope	332	0.002		51	0.315	8	0.047	7	0.053
change	982264	6.275		4982	30.812	3218	19.024	4098	30.885
climate	84551	0.540		2538	15.697	1851	10.943	3407	25.677
climate change	36531	0.233		1657	10.248	1313	7.762	2451	18.472
coastal	35126	0.224		1000	6.185	1194	7.059	727	5.479
commons	33267	0.213		231	1.429	77	0.455	16	0.121
conservation	84970	0.543		4448	27.510	4727	27.945	2216	16.701
conservation group	897	0.006		13	0.080	22	0.130	28	0.211
conserve (verb)	11206	0.072		249	1.540	500	2.956	265	1.997
countryside	63459	0.405		365	2.257	1560	9.222	535	4.032
cultural	139911	0.894		721	4.459	418	2.471	218	1.643
cultural diversity	4035	0.026		65	0.402	3	0.018	8	0.060
cultural heritage	5314	0.034		134	0.829	82	0.485	50	0.377
culture	200870	1.283		270	1.670	107	0.633	103	0.776
damage	157978	1.009		359	2.220	570	3.370	482	3.633
deforestation	1931	0.012		335	2.072	61	0.361	371	2.796
desert (noun)	19284	0.123		79	0.489	14	0.083	115	0.867
destroy	78214	0.500		99	0.612	129	0.763	268	2.020

destruction	42246	0.270		136	0.841	138	0.816	260	1.960
diversity	66525	0.425		1289	7.972	850	5.025	436	3.286
dynamics	26970	0.172		420	2.598	40	0.236	26	0.196
eco-	5527	0.035		161	0.996	18	0.106	81	0.610
ecological	17260	0.110		1629	10.075	848	5.013	415	3.128
ecology	15832	0.101		1863	11.522	332	1.963	172	1.296
economic	209551	1.339		1408	8.708	786	4.647	948	7.145
economy	126610	0.809		423	2.616	330	1.951	578	4.356
ecosystem	10406	0.066		3108	19.222	1061	6.272	997	7.514
ecosystem approach	208	0.001		113	0.699	105	0.621	33	0.249
ecosystem services	186	0.001		475	2.938	168	0.993	153	1.153
environment	340729	2.177		3258	20.150	3491	20.638	2601	19.603
environmental	191775	1.225		6280	38.840	3194	18.882	2349	17.704
environmentally	13142	0.084		175	1.082	269	1.590	177	1.334
expert	133138	0.851		227	1.404	120	0.709	166	1.251
expert knowledge	1098	0.007		0	0.000	6	0.035	1	0.008
extinction	6721	0.043		244	1.509	101	0.597	468	3.527
farmland	6726	0.043		177	1.095	322	1.904	258	1.944
fauna	6902	0.044		210	1.299	289	1.708	113	0.852
fear	126263	0.807		42	0.260	51	0.301	148	1.115
fishery	13027	0.083		439	2.715	225	1.330	287	2.163
flora	12841	0.082		248	1.534	424	2.507	132	0.995
forest	103343	0.660		2766	17.107	1820	10.759	2547	19.196
freedom	98293	0.628		33	0.204	24	0.142	22	0.166
freshwater	8085	0.052		328	2.029	327	1.933	270	2.035
garden	223111	1.425		182	1.126	381	2.252	467	3.520
geodiversity	163	0.001		36	0.223	134	0.792	2	0.015
geology	11641	0.074		98	0.606	358	2.116	49	0.369
global warming	11708	0.075		166	1.027	64	0.378	350	2.638
grassland	10813	0.069		495	3.061	2458	14.531	394	2.969
green	244803	1.564		454	2.808	2079	12.290	939	7.077
green space/greenspace	5147	0.033		96	0.594	1411	8.341	142	1.070
greenhouse effect	1199	0.008		23	0.142	4	0.024	18	0.136
habitat	41961	0.268		2567	15.876	5315	31.421	2513	18.940
heathland	3155	0.020		105	0.649	775	4.582	158	1.191
hedgerow	5511	0.035		74	0.458	422	2.495	89	0.671
heritage	85468	0.546		629	3.890	1077	6.367	389	2.932
independence	38520	0.246		18	0.111	6	0.035	5	0.038
indigenous	14788	0.094		230	1.422	88	0.520	136	1.025
interaction	72361	0.462		635	3.927	155	0.916	60	0.452
invasive	4708	0.030		208	1.286	124	0.733	195	1.470
landscape	93078	0.595		1455	8.999	2472	14.614	872	6.572
landscape(d) garden	1679	0.011		0	0.000	0	0.000	9	0.068
land-use change	691	0.004		103	0.637	32	0.189	47	0.354

loss	168178	1.074		683	4.224	888	5.250	805	6.067
management	535559	3.422		4279	26.464	4467	26.408	2078	15.661
man-made	4685	0.030		27	0.167	20	0.118	80	0.603
marine (adjective)	26717	0.171		1294	8.003	764	4.517	818	6.165
National Park	26776	0.171		398	2.462	464	2.743	219	1.651
National Trust	9960	0.064		51	0.315	243	1.437	516	3.889
native	49355	0.315		325	2.010	536	3.169	481	3.625
natural	203395	1.299		2166	13.396	2964	17.522	2007	15.126
natural capital	183	0.001		38	0.235	15	0.089	48	0.362
natural history	9903	0.063		89	0.550	79	0.467	46	0.347
nature	253035	1.617		1526	9.438	3533	20.886	1841	13.875
ocean	41406	0.265		302	1.868	120	0.709	336	2.532
open space	12719	0.081		29	0.179	479	2.832	69	0.520
organism	22502	0.144		434	2.684	130	0.769	106	0.799
peace	116530	0.744		27	0.167	17	0.100	27	0.203
peaceful	24234	0.155		10	0.062	10	0.059	12	0.090
peacefulness	240	0.002		0	0.000	0	0.000	0	0.000
plant	236929	1.514		1971	12.190	2082	12.308	1375	10.363
politics	89909	0.574		198	1.225	20	0.118	132	0.995
pollute	4028	0.026		25	0.155	31	0.183	43	0.324
pollution	37813	0.242		921	5.696	550	3.251	507	3.821
popular culture	4228	0.027		6	0.037	0	0.000	0	0.000
population	178489	1.140		1594	9.858	1475	8.720	1125	8.479
professional	326034	2.083		211	1.305	70	0.414	49	0.369
public access	5571	0.036		49	0.303	158	0.934	120	0.904
rainforest	7577	0.048		623	3.853	86	0.508	674	5.080
recreation	22191	0.142		178	1.101	657	3.884	157	1.183
reef	15611	0.100		218	1.348	169	0.999	279	2.103
reserve (noun)	50670	0.324		474	2.932	562	3.322	554	4.175
resource	371200	2.371		2470	15.276	1487	8.791	1088	8.200
right-to-roam/right to roam	381	0.002		0	0.000	5	0.030	1	0.008
RSPB	5138	0.033		147	0.909	844	4.989	1768	13.325
rural	104858	0.670		613	3.791	760	4.493	536	4.040
savanna(h)	1627	0.010		67	0.414	11	0.065	38	0.286
science	292418	1.868		1685	10.421	275	1.626	591	4.454
semi-natural	1381	0.009		77	0.476	523	3.092	178	1.342
sense of place	1529	0.010		9	0.056	28	0.166	14	0.106
soil	70174	0.448		2124	13.136	1266	7.484	591	4.454
solitude	3266	0.021		7	0.043	1	0.006	3	0.023
specialist	157547	1.007		220	1.361	165	0.975	98	0.739
species	138617	0.886		4082	25.246	6519	38.538	4177	31.481
spiritual	58789	0.376		56	0.346	21	0.124	33	0.249
sustainability	28390	0.181		1035	6.401	597	3.529	384	2.894

sustainable	85021	0.543		2357	14.577	1557	9.205	1574	11.863
terrestrial	8472	0.054		516	3.191	153	0.904	115	0.867
topography	4207	0.027		31	0.192	87	0.514	16	0.121
unsustainable	3544	0.023		52	0.322	39	0.231	113	0.852
urban	83224	0.532		1052	6.506	859	5.078	363	2.736
urban park	408	0.003		10	0.062	13	0.077	3	0.023
value	471895	3.015		1922	11.887	1500	8.868	827	6.233
vegetation	16038	0.102		874	5.405	630	3.724	334	2.517
voluntary	98571	0.630		65	0.402	294	1.738	112	0.844
volunteer	137844	0.881		65	0.402	230	1.360	169	1.274
wetland	9083	0.058		558	3.451	1284	7.591	576	4.341
wilderness	10940	0.070		253	1.565	39	0.231	65	0.490
wildlife	62000	0.396		915	5.659	3337	19.727	2084	15.706
Wildlife Trust	5856	0.037		45	0.278	499	2.950	67	0.505
woodland	41690	0.266		720	4.453	2938	17.369	2160	16.279

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