

Applying Q Methodology to understand private woodland owners' perspectives on public good provision in English woodlands

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Abstract

The role and nature of woodland and forest ownership is changing significantly in England. Environmental conservation and enhancement, the provision of recreation and amenity and the use of biofuels to mitigate climate change are being increasingly emphasized in new policy agendas. In light of the growing emphasis on multi-functional forestry, it is important to understand how woodland owners themselves perceive their role in delivering these social and environmental benefits. Recent research suggests that the availability of grants related to the provision of public access is unlikely to attract much interest from woodland owners, but incentives for longer-term management might be more in line with owners' goals. This paper describes a study that has applied Q Methodology to investigate the perceptions and attitudes of private woodland owners in three case study areas in England: Cornwall, the Lake District and the High Weald AONB, regarding their willingness or ability to deliver public goods. The Q analysis identified four distinct perspectives of woodland ownership and management, which can be described as: the Hobby Conservationist; the Self-Interested Owner; the Custodian and the Multifunctional Owner. The implications of the findings for forest policy and state incentive schemes are discussed.

Introduction

It is widely agreed that agriculture, and rural space more generally, in Western Europe has undergone a complex restructuring since the mid-1980s (Kristensen *et al.* 2004). The stimulus for this change was the drive for sustainability as a result of the Rio Earth Summit in 1992, the changes in the Common Agricultural Policy (CAP) that decoupled subsidies from production, the high cost of maintaining agricultural subsidies, public pressure, the WTO negotiations and an increase in environmental regulation in EU policy (Bowler and Ilbery 1999). This new farming context has been conceptualised by a number of writers (Bowler 1992; Marsden *et al.* 1993; Shucksmith 1993; Marsden 1995; Ilbery and Bowler 1998; Marsden 1998; Mather 2001; Mather *et al.* 2006) who suggest that agricultural and rural space is in a transition from productivism to post-productivism. Productivism characterises the post-war emphasis on production in the land-based sector. This is contrasted with a shift in emphasis where the countryside is increasingly seen as a place of consumption and protection, as well as production (Slee 2005; Holmes 2006). Farmers and other primary producers (such as foresters) are seeking new ways of making a living (Ilbery 1998), such as converting farm buildings into holiday accommodation. Cloke and Milbourne (1992, p. 360) describe this diversification of land use: "[There] is no longer one single rural space, but rather a multiplicity of social spaces that overlap the same geographical area."

The triggers for the evolution of post-productivism differ for agriculture and forestry. The major driver for the transition to post-productivism in farming was the cost of agricultural support, as well as overproduction and surpluses. Within forestry, however, the main issue was a fall in timber prices over the past 15 years resulting in many non-industrial private forest owners harvesting well below their sustainable increment (Slee *et al.* 2006), as well as

social injustice (e.g. tax incentives for the wealthy), and the increase in woodland planting on agricultural land under the Farm Woodland Scheme. At the same time, forests were becoming emblematic of environmental issues globally (Mather et al. 2006). This led to the development of new UK Forest Strategies and a new Woodland Grant Scheme (WGS) which replaced the Forestry Grant Scheme (FGS). Under the FGS timber production had to be the primary objective whereas under the new WGS this was no longer mandatory and wider issues such as biodiversity and recreation were of increasing importance.

Recent data provided by the National Inventory for Woodland and Trees (FC 2003) reveal a considerable concentration of privately owned woodland in densely populated areas, especially in central and southern England where private forest ownership accounts for 80%+ of forest cover and where the marginal benefit from public good investment might be very high. These private woodland owners are not a homogeneous group. They consist increasingly of a diverse mix of traditional or farm woodland owners, together with a wide range of new, socially-oriented owners who may have little previous experience of woodland management.

A study by Slee *et al.* (2003) concluded that 90% of the total economic impact of forestry on rural development arises from indirect effects unrelated to production (e.g. through tourism and local residence associated with quality of life). The high prices often paid for rural land and woodland are also reflective of amenity-based consumptive values rather than productive values. This has implications for developing policy mechanisms to enhance public benefit. While such owners may be able to internalise some of the costs for public benefit provision through their own consumptive activities (such as maintaining rides for personal access which also provides biodiversity benefits) their non-profit-making motivations may limit the amount of public good enhancement they can achieve without state support.

In this shifting policy context, it is important to understand how land owners perceive their role in providing these benefits and how they will respond to policy changes. Indeed, the motivations of land managers may be influenced by changing external factors, such as policy instruments, and it is important to understand these normative assumptions and values when looking at how individuals might respond to new policies (Davies and Hodge 2007). As suggested by Davies and Hodge (2007), “policy assumptions and instruments that are at odds with the underlying motivations of agents may actually reduce achievement of policy objectives” (p. 1). Barry and Proops (1999) agree: “until we know the ‘discourses’ people use about the environment, it will be very hard to judge what, and whether, environmental policies will be socially acceptable, and therefore capable, of being implemented” (pg. 338). Thus, it is important to understand the ownership and management motivations of these woodland owners as “knowledge of forest owners’ values, attitudes and ownership objectives is ... of crucial importance in understanding and predicting forestry behaviour in private woodlands” (Dhubhain *et al.* 2006).

The aim of this study is to explore and describe the range of perceptual frameworks that exist among private woodland owners in 3 case study areas: the Lake District, Cornwall and the High Weald AONB. The emphasis is on owners' willingness or ability to deliver public benefits in their woodlands. Employing a semi-structured survey method, Q Methodology, the significant perceptual viewpoints of the survey participants are described, which reveal different and distinctive types of woodland owner characterised by their reasons for woodland ownership and their objectives for management. Each owner type has a distinct understanding of how the responsibility for public good provision in English woodlands should be divided between the individual owner and the state.

The following section reviews the literature relating to existing classifications of private woodland owners and section 3 describes the methodology applied in this study. Section 4 presents the four distinct woodland owner types that emerged out of the analysis and Section 5 discusses these in relation to their policy implications, focusing on grant incentive schemes in particular. Finally, the conclusions of the study are presented in Section 6.

EXISTING CLASSIFICATIONS OF PRIVATE WOODLAND OWNERS

In Europe, private forest ownership has historic roots, with large areas of forestland traditionally owned by royal families and aristocrats. These forests were often managed for both game hunting and timber. However, in spite of a remnant of aristocratic ownership, a large proportion of the forest estate, in the form of small parcels, is now in private ownership. This structural change in woodland ownership parallels that of the emergence of hobby farming in the agricultural sector. As well as farm forest owners, a new type of forest owner has emerged, motivated less by economic gain and more by socially-motivated objectives, such as nature conservation and personal enjoyment. In order to understand the diversity of woodland ownership, a number of researchers have attempted to classify private woodland owners. Most of these studies have been in non-UK settings, such as mainland Europe or the United States, where forest ownership structure may differ to that in the UK.

Most of the existing typologies of private woodland owners classify owners into two main groups: production-oriented and consumption/protection-oriented (Dhubhain et al. 2006). Production-oriented owners are generally motivated by the production of wood or non-wood goods and services, usually with the objective of generating economic activity. For instance, Kurtz and Lewis (1981) in a study of forest owners in the eastern United States and Marty *et al.* (1988) in Missouri, labelled production-oriented owners as *timber agriculturists*. These owners were concerned with growing and harvesting timber in order to maximise the financial return from the wood crop. Similarly, Kline *et al.* (2000) classified American forest owners who stressed timber production as *timber producers*. In studies in Europe, production-oriented owners are classified as *investors*, with emphasis on the forest as an asset and source of security, or as *self-employed owners*, who rely on the forest for their income (Kuuluvainen et al. 1996; Karpinnen 1998). Similarly, Mizraite and Mizaras (2005) labelled owners who earn an income from the sale of wood and non-wood products from their forests as *businessmen*. In Germany, owners who stress wood sales and financial security as important are classified as *economically oriented* (Becker et al. 2000; Von Mutz et al. 2002) or *economically interested* (Bieling 2004). Owners who placed an emphasis on timber production in a study in Denmark are labelled *classic forest owners* (Boon et al. 2004) and similar forest owners are considered *traditional woodland owners* in a recent preliminary study in England (Urquhart 2006).

In contrast to production-oriented owners, consumption/protection-oriented owners are motivated by amenity, nature conservation or other non-financial objectives. These objectives can be broadly divided into three classes: consumption of wood, non-wood consumption or protection and passive. Owners concerned with the consumption of wood and non-wood products for their own private use have been termed *consumers* by Mizaraite and Mizaras (2005) in a study in Lithuania and *self-interested owners* by Wiersum *et al.* (2005) in a study in Europe. Such owners may rely on the wood products they derive from their woodland for their own personal use, such as firewood, stakes, poles or fence posts.

A number of typologies have identified owners with non-wood consumption or protection objectives, such as nature conservation, recreation, landscape and protecting the woodland resource for future generations. Both Kuuluvainen *et al.* (1996) and Karpinnen (1998) in Finland describe owners who emphasise amenity and the recreational benefit of their woodlands as *recreationists*. These woodland owners stress the importance of the non-timber aspects of their forest ownership, including recreation, aesthetics and berry-picking. The term *recreationists* was also used in a study of American forest owners by Kline *et al.* (2000), who valued the recreational benefits of their forest as well as the importance of preserving the resource for future generations. Similarly, in an American study, Marty *et al.* (1988) describe owners who value recreation and enjoyment of their forest as *forest recreationists*.

Protection-oriented woodland owners are classified as those owners who prioritise nature conservation or other protective values in their forest. Lithuanian woodland owners who are motivated by nature conservation objectives are described as *ecologists* by Mizaraite and Mizaras (2005). In a study in Sweden, Hugosson and Ingermarson (2004) classify owners who emphasise the protection function of their forest as *conservationists*, while Wiersum *et al.* (2005) use the term *environmentalists* for owners who emphasise the importance of nature and landscape.

In many instances, forest owners value both the amenity benefits and the nature conservation value of their forests. In this instance, a range of terms is used to describe such owners. For instance, in Denmark, Boon *et al.* (2004) use the term *hobby owner* for owners who consider their woodland as a hobby and who value the aesthetic and biodiversity benefits. In Germany, von Mutz *et al.* (2002) prefer the term *leisure-oriented owner* for owners who see their forest as a place for recreation, hunting or nature conservation and Becker *et al.* (2000) describe the owner motivated by recreation and nature conservation as *the ecological type*.

The third type of consumption/protection-oriented owner, the passive owner, has an indifferent attitude towards their woodland. In a study in Germany, Volz and Bieling (1998) describe the *resigning owner* as perceiving their forest as having no real value, but simply creating work and worry for the owner. Similarly, Boon *et al.* (2004) in Denmark described *indifferent farmers* as being generally indifferent towards the benefits of being a forest owner. In a study of European forest owners, Wiersum *et al.* (2005) classified a group of owners as *indifferent*, having low levels of motivation towards their forest. In the United States, Kline *et al.* (2000) identified *passive* forest owners who had no main objectives, but felt that owning the forest was the most important aspect of their ownership.

The distinction between owner objectives is not clear-cut, however. Often, owners may have a range of objectives and motivations, so placing them into one owner type is problematic. Owners may have distinct production-oriented objectives, but they may well also value the amenity or nature conservation benefits of their woodland. Boon *et al.* (2004) describe owners in Denmark who are motivated by economic concerns as well as environmental or amenity values as *multi-objective owners*. Kuuluvainen *et al.* (1996) and Karpinnen (1998) use the same term to describe owners in Finland who value both the economic and amenity benefits from their woodland, as do Kline *et al.* (2000) in a study in the United States and Mizaraite and Mizaras (2005) in Lithuania. In a study of forest owners in Europe, Wiersum *et al.* (2005) use the term *multi-functional forest owners* to describe owners who attach equal importance to the economic benefits, nature conservation and landscape values of their forests. In the United States, Marty *et al.* (1988) classify such owners as *utilitarians* and in a studies in Germany they are considered *universally motivated* (Becker *et al.* 2000) or *conceptually interested* (Bieling 2004). Marty *et al.* (1988) also use the term *timber conservationists* to describe owners who pursue sustained timber production objectives but also have a concern for wildlife.

Table 1: Private forest owner types as identified in the literature.

Study	Country	Production goals	Multiple objectives	Consumption/ Protection
(Kurtz and Lewis 1981)	United States	<i>Timber agriculturist</i> -timber production and financial return.		<i>Forest environmentalist</i> -aesthetic values, wildlife and privacy.
(Marty <i>et al.</i> 1988)	United States	<i>Timber agriculturist</i> -timber production for profit.	<i>Utilitarians</i> -equal priority to variety of uses. <i>Timber conservationists</i> -sustained timber production and concern for wildlife.	<i>Forest recreationists</i> -value recreation and enjoyment of forest.
(Kuuluvainen <i>et al.</i> 1996)	Finland	<i>Investor</i> -forest as asset, source of income and security. <i>Self-employed owner</i> -employment and labour income.	<i>Multiobjective owner</i> -values both economic and amenity benefits.	<i>Recreationist</i> -values recreation.
(Loenstedt 1997)	Sweden	<i>Formal economic goals</i> -aim to achieve positive cash flow.		<i>Informal economic goals</i> -profits from hunting and firewood. <i>Environmental goals</i> -

		<i>Production goals</i> -increase standing volume and increment of forests.		aesthetic appreciation of forest.
(Karpinnen 1998)	Finland	<i>Investor</i> -regard their forest as a source of economic security 13% <i>Self-employed</i> -employment from forest.	<i>Multi-objective</i> -values equally monetary benefits and amenity 26%	<i>Recreationist</i> -emphasis amenity and recreation values 31%
(Volz and Bieling 1998)	Germany	<i>Homo oeconomicus</i> -calculatory, optimizing.	<i>The traditionalist</i> -influenced by handed-over values. <i>The responsible owner</i> -acts to hand over forest to children.	<i>The idealist</i> -likes to see forest grow, forest work and independence. <i>The resigning owner</i> -distrusts policy. Forest of no real value to owner, only work and worry
(Becker et al. 2000)	Germany	<i>Economically oriented</i> -financially motivated, property and investment.	<i>Universally interested</i> -evenly motivated.	<i>The ecological type</i> -motivated by recreation, natural experiences, nature conservation.
(Kline et al. 2000)	United States	<i>Timber producer</i> -stress timber production and land investment.	<i>Multi-objective</i> -emphasise economic benefits, non-timber benefits and personal gratification equally.	<i>Recreationist</i> -value recreation and enjoyment of green space. <i>Passive</i> -underline owner gratification – enjoyment of owning the forest most important.
(Von Mutz et al. 2002)	Germany	<i>Economically oriented owners</i> -source of income for consumption and security.		<i>Leisure-oriented</i> -outdoor recreation, hunting, nature conservation.
(Bieling 2004)	Germany	<i>Economically interested</i> -wood sales, financial security.	<i>Conceptually interested</i> -values personal experience, own wood supply, recreation,	<i>Disinterested</i> -no objectives important except to keep forest in family ownership.

			inheritance value.	
(Boon <i>et al.</i> 2004)	Denmark	<i>Classic forest owner</i> -greatest emphasis on income generation 52%	<i>Multi-objective</i> -motivated by financial, environmental and other values 18%	<i>Hobby owner</i> -forest used for hobby activities; value aesthetic and biodiversity 30% <i>Indifferent farmer</i> -generally indifferent towards benefits of being forest owner
(Hugosson and Ingermarson 2004)	Sweden	<i>Production motivations</i> -wood production and harvesting. <i>Economic efficiency goals</i> -economic objectives.		<i>Conservationist</i> -emphasise protection function of forest.
(Mizaraitė and Mizaras 2005)	Lithuania	<i>Businessman</i> -earn income from sales of wood and non-wood products 29%	<i>Multi-objective</i> -hold multiple objectives 31%	<i>Consumer</i> -main motivation is the extraction of wood and non-wood products for personal use 22% <i>Ecologist</i> -value nature conservation 18%
(Wiersum <i>et al.</i> 2005)	Europe		<i>Multi-functional</i> -attach equal priority to economy, nature and landscape 17%	<i>Self-interested</i> -own forest mostly to provide products for own use 16% <i>Environmentalist</i> -place priority on nature and landscape 30% <i>Indifferent</i> -a low level of motivation concerning all forest functions 37%
(Urquhart 2006)	England	<i>Traditional woodland owner</i> -emphasis on income generation from timber management and investment.		<i>Community woodland owner</i> -places priority on public amenity. <i>Resident new woodland owner</i> -priority is wildlife conservation and personal enjoyment.

				<i>Farmer</i> -indifference to woodland. <i>Non-resident new woodland owner</i> -owner gratification; enjoyment of owner woodland most important
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Clearly, private woodland owners have a range of diverse objectives for their woodlands. Some of those objectives may well align with the aims of public policy for providing public benefits. However, there often appears to be a barrier between effective policy delivery and the private woodland owner. For example, a study undertaken in 2002 to investigate the attitudes and perceptions of private woodland owners to public access revealed that the availability of grants related to the provision of public access was unlikely to attract much interest from woodland owners. The study suggested that there would be more positive attitudes towards grant aid that related to the broader motivations for improving woodland management (Church *et al.* 2005). While most of the woodland owners in the study had benign attitudes towards public access, with 80% already having public access in their woodlands, they were more interested in boosting the commercial potential of their woodlands through appropriate incentives.

Thus, a better understanding of the motivations of private woodland owners is required. Understanding their motivations and objectives, therefore, needs to be based not only on the owner's occupation (i.e. farmer or non-farmer) or their proximity to the woodlands, but, crucially, on their objectives for woodland ownership and management (e.g. nature conservation, personal enjoyment). No classification of private woodland owners has yet been undertaken in the United Kingdom, representing an important gap in the literature. This study aims to address this gap by developing a typology of private woodland owners in England and thus the objectives and motivations of different woodland owner types. By so doing, this study will help to identify which private owner types are best placed and willing to deliver enhanced public good benefits in their woodlands.

METHODOLOGY

Background to Q Methodology

Over recent years there has been a methodological shift in rural research with a move towards more participatory and qualitative methods (for example, Lyon 2005; Dougill 2006). In light of this shift, the present study adopted Q methodology, a technique that is relatively little known and rarely used in rural research (Previte *et al.* 2007). Q methodology was devised by British physicist and psychologist William Stephenson in the 1930s and is described in his book *The study of behaviour: Q technique and its methodology* (Stephenson 1953). Q Methodology offers a technique that "can be seen to be a bridge between the positivist and post-positivist schools of policy analysis as it features replicability and empirical rigour that is demanded by the former, yet is focused on the subjective, self-referential opinions of participants that are required by the latter" (Ellis *et al.* 2007, p. 523).

Until recently Q methodology has mostly been used in the US in the fields of communication,

shared set of perceptions, beliefs or opinions (Previte et al. 2007). In the context of this study, the discourse under investigation was the attitudes of private woodland owners towards the delivery of public benefits in their woodlands.

The second stage involves identifying a ‘concourse’ or a set of statements relating to the discourse. These statements should be “broadly representative of the opinion domain at issue” (Watts and Stenner 2005, pg. 75). The statements can be either naturalistic or ready-made (McKeown and Thomas 1988). Naturalistic statements are those emerging from the respondents, either in written or oral form. Generally the researcher would conduct interviews with participants in order to construct the concourse. Alternatively, ready-made statements can be compiled from existing sources, including other academic studies, related literature, newspaper articles and so on. For example, Swaffield and Fairweather (2000) used a set of photographs to represent different aspects of a discourse about forest sector development. Obviously, naturalistic statements are more likely to be familiar and understood by respondents as they are constructed by the respondents themselves. In practice, a hybrid sample of statements is often used, including both naturalistic and ready-made statements. In this case, the statements were constructed from interviews conducted with 20 private woodland owners in a preliminary scoping study (Urquhart, 2006). These statements were supplemented by statements compiled from other sources, including the academic literature, Forestry Commission reports and researcher knowledge.

The third stage of Q involves reducing the concourse of statements down to a manageable number, or a Q sample. The Q sample is the set of statements that participants will be asked to sort in the following stage. Therefore, the statements need to be clear and unambiguous. The statements must reflect the complexity of the issue but also allow for individual experience to be represented (Previte et al. 2007). The concourse is usually about three times the size of the Q sample (Stainton Rogers 1995, pg. 185). Since the Q sample usually ranges from between 30 and 60 statements (Thomas and Watson 2002, pg. 142), the initial concourse requires 90-180 statements. In this study, the concourse consisted of 124 statements. Since it is recommended that there should be approximately three times as many statements in the concourse as in the Q sample (Stainton Rogers 1995, pg. 1854), a set of 36 statements was found to be the most appropriate for this study.

There are various techniques to ensure the Q sample is sufficiently encompassing without unnecessary duplication and correlation. With an unstructured approach, statements presumed to be relevant are chosen without specific effort to ensure all possible sub-issues are included. The risk of this approach is that some issues or sub-issues may be under- or over-sampled (McKeown and Thomas 1988). Barry and Proops (1999), however,, employed a structured approach to selecting their Q sample in their study of discourses about LETS (Local Exchange Trading Systems) in the UK. Following Dryzek and Berejikian (1993) they employed a 4x4, 16-cell ‘concourse matrix’ to sample the available statements. This allowed the statements to be filtered, resulting in a representative range of statements.

Statements in the present study were chosen according to the design presented in Table 2, as suggested by (McKeown and Thomas 1988, pg. 14).

Table 2: Concourse matrix for Q set sampling.

Main Effects	Components	N
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A. Direction	a. Financially-oriented	b. Socially-oriented	2
B. Dimensions	c. Moral	d. Pragmatic	2
C. Issues	e. Behaviour	f. Motivation	4
	g. Consequences	h. Attitude	

All possible combinations in the concourse matrix were considered (for example, *ace*, *acf*, *acg*, *ach*, etc.) resulting in 16 combinations across the 124 statements. Thus, each statement was placed in the concourse matrix according to its particular direction, dimension and the issues it contained. For example, the statement “Wildlife conservation should only be considered once you have reached financial objectives” was classed as *ade*, since it is a financially-oriented statement which takes a pragmatic stance affecting the woodland owner’s behaviour. The appropriate number of statements from each category were selected, based on trying to achieve as broad a range of statements as possible, without undue overlap. While this process is subjective, the use of the concourse matrix allows statements to be selected in a consistent and logical manner. The 36 statements selected for the Q sample from the concourse are indicated in Table 3.

Table 3: 36 statements for Q sort.

1	Woodlands should be utilized more as a sustainable fuel source.
2	Forest owners have a greater responsibility to produce timber than to conserve the rural environment.
3	Woodland owners should be rewarded for the wider benefits to society their woods provide.
4	Enough is already being done to protect and enhance the rural environment.
5	Sport shooting is a strong motivation for me to manage my woodland.
6	Multi-functional forestry – delivering social, environmental and economic benefits together – is not possible.
7	The possibility of being sued makes me unwilling to risk public access.
8	I believe that woodlands should be left alone to let nature take its course.
9	Market forces are more effective at stimulating woodland management than public sector schemes and regulations.
10	If there was decent money to be made out of woodlands I would manage my woodland better.
11	Applying for a woodland grant is not worth the effort.
12	Most woodlands are under-utilized in terms of harvesting wood or wood products.
13	Woodlands are important because they help to mitigate climate change by absorbing carbon.
14	Woodland owners should protect unique or rare habitats on their land regardless of what incentives are available.
15	Woodland owners should have the right to manage their woodlands as they wish.
16	My main reason for owning a woodland is to maintain it as a wildlife reserve.
17	Woodlands are an important element in the landscape.
18	I do not manage my woodland to make money.
19	The more a wood is used by local people the more it is valued.
20	Woodland owners have a duty to maintain the woodland resource for the next generation, whatever impact this has on profits.

21	Through owning a woodland I have become more environmentally-aware.
22	Woodlands provide an escape from every-day life by allowing people to get closer to nature.
23	Woodlands have intrinsic value and should be valued for themselves and not just for what humans can get out of them.
24	The local community benefits from my woodland.
25	There is not much point in owning your own woodland if it is opened up for public access.
26	There are conflicts between managing a woodland for wildlife and allowing public access.
27	The size of a woodland dictates what sort of public benefits can be provided.
28	There should be more access routes into woodland to help people visit the countryside.
29	I get a lot of personal enjoyment from my woodland.
30	Public safety is an important consideration for woodland management.
31	Owners should learn as much as possible about their woodland in order to manage it properly.
32	I do not have enough time to manage my woodland properly.
33	I bought my woodland as an investment.
34	Information and advice for woodland owners needs to be more readily available.
35	Decisions about woodland are made by outsiders who work in offices over land they do not know.
36	Woodland grant schemes really help woodland owners carry out management activities in their woods.

The statements were pre-tested with 5 volunteer woodland owners, a handful of academic researchers familiar with Q Methodology and staff at the Forestry Commission. As a result, some minor alterations to the statements were made in order to improve clarity. A list of private woodland owners in the three case study areas was obtained from the Forestry Commission, Cumbria Woodlands and the High Weald AONB. A random sample of 30 owners were recruited by letter seeking their participation in the survey. A cover letter from the Forestry Commission (or Cumbria Woodlands where appropriate) was enclosed, indicating that the study had the support of this agency.

The fourth stage is to ask participants to sort the statements onto a ranked grid (see Table 1). Each of the participants was visited in person between January and March 2008 and asked to sort the 36 statements (Table 3) onto the ranked grid. The respondents were asked to sort the statements according to how strongly they agree (+4) or disagree (-4) with each statement in the Q set. Statements ranked 0 or close towards the middle of the grid are those items that the respondent feels less strongly or ambivalent about. While the respondents are free to place each statement where they wish, they are confined by the boundaries of the grid, forcing a quasi-normal distribution. A short interview was also conducted, in order to gather descriptive information such as size of woodland, length of ownership etc. This also enabled participants to describe why they sorted the statements in a particular way and give any further background information relating to themselves or their woodland which would be useful in explaining the results from their Q sort.

ANALYSIS OF RESULTS

The final stage of the process is the analysis of the data. Fundamentally, Q methodology involves the correlation and factoring of persons as opposed to traits or tests (as in R-method) (McKeown and Thomas 1988). Each emergent factor represents a point of view and the association of each respondent with each point of view is indicated by his/her loading on that factor. Individuals who have high loadings on the same factor will have a similar outlook or perspective on the issue. Each statement in the Q sample is also scored for each factor. This can help the researcher to understand and interpret the results by indicating which statements are particularly significant for each factor (or discourse).

Data analysis in Q methodology is a three-step process: correlation, factor analysis and the computation of factor scores (McKeown and Thomas 1988). The analysis of the Q sorts was carried out using the PQMethod software (which can be downloaded free from the internet). The software is tailored to the requirements of Q studies and allows the data (Q sorts) to be entered as they are collected as 'piles' of statement numbers (Schmolck 2002). A centroid method analysis was initially performed, followed by both a varimax and judgmental, manual rotation using PQROT software. In order to determine whether or not a factor is significant, the eigenvalue criterion was employed. This method indicates a factor's significance by estimating the sum of its squared factor loadings. By convention, factors with eigenvalues greater than 1.00 are considered significant (McKeown and Thomas 1988). As a result, four factors were kept for rotation, accounting for 52% of the variance (30%, 7%, 9% and 6% respectively). The four factors extracted provide four distinct interpretations of private woodland owners' willingness and ability to deliver public good benefits, revealed through the Q analysis procedure.

Several rotations were undertaken in order to establish which would enable the most meaningful interpretation of the data. Following standard Q procedure, the factor arrays (i.e. a model or idealised Q sort for each factor), distinguishing statements (i.e. statements that are particularly salient to each factor) and consensus statements (those which do not distinguish between any pair of factors) and qualitative data from the interviews were used to determine which rotation provided the best distribution of explained variance between the four factors. This allowed meaningful interpretation of the results and provided factor arrays and distinguishing statements with which to describe each factor. These related well to the descriptive statistics and qualitative data from the interviews.

Factor loadings of the varimax/manual rotation of the four-factor solution of the study's 30 sorts are shown in Table 4.

Table 4: Factor loadings for Q sorts (significant loadings are denoted in bold; italics denotes defining sorts).

Q SORT	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
1	0.54	0.27	-0.23	0.01
2	0.82	-0.05	-0.09	0.01
3	0.67	0.07	0.26	0.09
4	0.42	-0.22	0.70	0.02
5	0.38	-0.26	0.08	0.43
6	0.14	0.31	0.25	0.54
7	0.36	-0.12	0.51	0.32

8	-0.01	0.56	0.08	0.13
9	0.39	0.11	0.66	-0.19
10	0.61	0.08	0.44	-0.02
11	0.55	0.27	-0.15	0.40
12	0.66	0.08	-0.02	0.23
13	0.27	-0.01	0.13	-0.27
14	0.74	-0.14	0.25	-0.05
15	0.67	-0.02	-0.01	-0.19
16	0.20	-0.69	-0.04	-0.05
17	0.36	0.08	0.50	-0.10
18	0.67	-0.16	0.15	0.31
19	0.47	0.14	-0.09	-0.44
20	0.45	0.26	0.09	0.11
21	0.80	-0.00	-0.07	0.14
22	0.83	-0.17	-0.24	0.14
23	-0.18	0.16	0.66	0.08
24	-0.63	0.06	0.01	0.25
25	0.74	-0.04	0.20	0.35
26	0.34	0.19	0.49	0.17
27	0.69	-0.45	0.02	-0.04
28	0.78	-0.07	-0.13	-0.04
29	0.22	0.60	0.05	0.03
30	0.42	-0.12	-0.04	0.58

Factor loadings are in effect correlation coefficients and indicate the extent to which a Q sort is similar or dissimilar to the ‘ideal’ Q sort for each factor. As a rule of thumb, correlations are generally considered to be statistically significant at 2.5 times the standard error. The standard error for a factor loading is given by the expression: $SE = 1/\sqrt{N}$, where N is the number of statements in the Q sample. Since this study contained 36 statements, the standard error of the factor loadings shown in Table 4 is $SE = 1/\sqrt{36} = 0.167$. Thus, loadings in excess of $2.5(SE) = \pm 0.42$ are statistically significant at the .01 level and are indicated by bold text in Table 4. There is one “null” case (i.e. a Q sort that does not significantly load on any of the factors), which relates to Participant 13. This could be due to the fact that this participant, while previously owning over 400 hectares of woodland, had sold most of it to the Forestry Commission and the Woodland Trust, retaining just 15-20 hectares. It may be that this participant had lost interest in his woodland and, thus, did not correlate significantly with any of the factors.

In order to construct the factor array, defining sorts were identified using the automatic flagging facility in PQROT, as well as manual flagging (to remove flags from the “null” case and flags on cases which loaded highly on more than one factor (cases 10 and 27). These defining sorts are denoted by italics in Table 4). The resulting factor arrays are shown in Table 5.

Table 5: Factor arrays.

No.	Statement	F1	F2	F3	F4
1	Woodlands should be utilized more as a sustainable fuel source	3	3	-1	3
2	Forest owners have a greater responsibility to produce timber	-2	-1	-3	-3

	than to conserve the rural environment				
3	Woodland owners should be rewarded for the wider benefits to society their woods provide	1	3	-4	1
4	Enough is already being done to protect and enhance the rural environment	-3	0	-2	-4
5	Sport shooting is a strong motivation for me to manage my woodland	-3	-1	-2	1
6	Multi-functional forestry – delivering social, environmental and economic benefits together – is not possible	-4	-2	0	0
7	The possibility of being sued makes me unwilling to risk public access	-2	2	0	2
8	I believe that woodlands should be left alone to let nature take its course	-4	-1	-1	-2
9	Market forces are more effective at stimulating woodland management than public sector schemes and regulations	0	-2	-3	1
10	If there was decent money to be made out of woodlands I would manage my woodland better	0	2	-2	2
11	Applying for a woodland grant is not worth the effort	-2	1	-1	-4
12	Most woodlands are under-utilized in terms of harvesting wood or wood products	3	1	1	2
13	Woodlands are important because they help to mitigate climate change by absorbing carbon	2	3	1	0
14	Woodland owners should protect unique or rare habitats on their land regardless of what incentives are available	2	-4	3	2
15	Woodland owners should have the right to manage their woodlands as they wish	-1	4	1	-1
16	My main reason for owning a woodland is to maintain it as a wildlife reserve	-1	0	4	-2
17	Woodlands are an important element in the landscape	4	2	3	3
18	I do not manage my woodland to make money	-1	1	2	1
19	The more a wood is used by local people the more it is valued	1	1	-1	-2
20	Woodland owners have a duty to maintain the woodland resource for the next generation, whatever impact this has on profits	2	-2	2	4
21	Through owning a woodland I have become more environmentally-aware	0	-3	0	0
22	Woodlands provide an escape from every-day life by allowing people to get closer to nature	1	-3	1	0
23	Woodlands have intrinsic value and should be valued for themselves and not just for what humans can get out of them	2	1	3	-1
24	The local community benefits from my woodland	1	-1	0	-3
25	There is not much point in owning your own woodland if it is opened up for public access	-3	0	1	-1
26	There are conflicts between managing a woodland for wildlife and allowing public access	0	2	2	3
27	The size of a woodland dictates what sort of public benefits can be provided	0	0	0	-1
28	There should be more access routes into woodland to help	-1	-4	-2	-3

	people visit the countryside				
29	I get a lot of personal enjoyment from my woodland	4	0	4	1
30	Public safety is an important consideration for woodland management	1	-1	-3	-1
31	Owners should learn as much as possible about their woodland in order to manage it properly	3	-3	2	1
32	I do not have enough time to manage my woodland properly	-1	4	-1	-2
33	I bought my woodland as an investment	-2	-2	-4	-1
34	Information and advice for woodland owners needs to be more readily available	-1	1	1	0
35	Decisions about woodland are made by outsiders who work in offices over land they do not know	0	0	0	-1
36	Woodland grant schemes really help woodland owners carry out management activities in their woods	1	-1	-1	4

Three statements (2, 17, 35) were shown to be consensus statements in that they do not distinguish between any pair of factors (non-significant at $p > 0.01$) with statements 17 and 35 also being non-significant at $p > 0.05$ (Table 6). All factor arrays indicate disagreement with the statement “Forest owners have a greater responsibility to produce timber than to conserve the rural environment”, indicating that all participants perceive conserving the rural environment as more important than timber production. Conversely, all factor arrays indicate agreement with the statement “Woodlands are an important element in the landscape”, while most participants were ambivalent about the statement “Decisions about woodland are made by outsiders who work in offices over land they do not know.” Since these statements do not distinguish between any pairs of factors, they are not considered in the following analysis of each factor.

Table 6: Consensus statements.

No.	Statement	1	2	3	4
2	Forest owners have a greater responsibility to produce timber than to conserve the rural environment	-2	-1	-3	-3
17	Woodlands are an important element in the landscape	4	2	3	3
35	Decisions about woodland are made by outsiders who work in offices over land they do not know	0	0	0	-1

The following section describes the four factors by discussing the salient statements for each factor. These were the statements assigned +4 or +3 (most agree with) and -4 or -3 (most disagree with) in the idealized Q sort for each factor. Also, statements that distinguish each factor from the others (at $p < 0.01$) are also discussed, together with evidence from the interviews. Of the 30 participants, 17 loaded heavily on Factor 1, 4 on Factor 2, 7 on Factor 3 and 4 on Factor 4. Each factor is identified with a name according to its dominant characteristics and represents the views of groups of similarly-minded woodland owners. The four groups are as follows: F1: Multifunctional owner (15); F2: Self-interested owner (3); F3: Hobby conservationist (6) and F4: Custodian (3). (The number of owners who are uniquely associated with each of the factors – i.e. for whom it was their only significant factor loading – are shown in parenthesis).

Factor 1 (F1): The Multifunctional Owner

The multifunctional owner is characterised by a strong belief that multifunctional forestry is possible. They are happy to combine the management of their woodlands for wildlife, public access and the production of some wood products. They gain a lot of personal enjoyment from their woodlands. Seventeen of the participants in this study loaded significantly on this factor, fifteen of which were defining sorts (Table 4). Eleven statements (22, 24, 36, 30, 10, 26, 18, 7, 25, 8, 6) distinguish this factor from the other factors at a significance level of $p < 0.01$; and a further three statements (29, 28, 11) also distinguish this factor from the other factors at a significance level of $p < 0.05$ (Table ?).

Table 7: Salient statements for Factor 1 (+4, +3, -3, -4; * denotes distinguishing statements at $p < 0.05$; ** denotes distinguishing statements at $p < 0.01$; consensus statements shown in italics)

No.	Statement	Factor score
29*	I get a lot of personal enjoyment from my woodland	4
17	<i>Woodlands are an important element in the landscape</i>	4
1	Woodlands should be utilized more as a sustainable fuel source	3
12	Most woodlands are under-utilized in terms of harvesting wood or wood products	3
31	Owners should learn as much as possible about their woodland in order to manage it properly	3
22**	Woodlands provide an escape from every-day life by allowing people to get closer to nature	1
24**	The local community benefits from my woodland	1
36**	Woodland grant schemes really help woodland owners carry out management activities in their woods	1
30**	Public safety is an important consideration for woodland management	1
10**	If there was decent money to be made out of woodlands I would manage my woodland better	0
26**	There are conflicts between managing a woodland for wildlife and allowing public access	0
28*	There should be more access routes into woodland to help people visit the countryside	-1
18**	I do not manage my woodland to make money	-1
11*	Applying for a woodland grant is not worth the effort	-2
7**	The possibility of being sued makes me unwilling to risk public access	-2
25**	There is not much point in owning your own woodland if it is opened up for public access	-3
5	Sport shooting is a strong motivation for me to manage my woodland	-3
4	Enough is already being done to protect and enhance the rural environment	-3
8**	I believe that woodlands should be left alone to let nature take its course	-4
6**	Multi-functional forestry – delivery social, environmental and	-4

economic benefits together – is not possible

The multifunctional owner strongly supports the notion of multi-purpose forestry (4). This is reflected in the relatively equal consideration that this owner gives to the social, environmental and economic benefits that arise from woodlands. This owner type gets a lot of personal enjoyment from their woodland (4), as does the hobby conservationist (4). In this regard, the multifunctional owner can be considered as either a hobby owner or one who very much enjoys their work in the woodland.

While making money from their woodland is not a priority, they take a pragmatic approach to funding woodland management, and will take grants or sell wood products if this helps to pay for the management costs. Out of all the factors they agree least with the statement “I do not manage my woodland to make money” (-1), reflecting their pragmatic stance. They agree strongly with the statements “Woodlands should be utilized more as a sustainable fuel source” (3) and “Most woodlands are under-utilized in terms of harvesting wood or wood products” (3), suggesting that they would like to see the development of a market for wood products.

What distinguishes this factor is their entrepreneurial approach to woodland management. For example, Participant 14 is setting up a tree nursery in order to provide local employment and get people interested in woodland management. Participant 28 is planning to develop his newly planted woodland site into an eco-park, with eco-pods for sustainable tourism. Others are keen to provide an educational resource, either through traditional wood crafts (such as basket weaving, hurdle making, or walking sticks) or providing visitor interpretation to educate people about the wildlife, woodland and management activities.

Table 8: Factor array for statements relating to public access.

No	Statement	F1	F2	F3	F4
7	The possibility of being sued makes me unwilling to risk public access	-2	2	0	2
24	The local community benefits from my woodland	1	-1	0	-3
19	The more a wood is used by local people the more it is valued	1	1	-1	-2
22	Woodlands provide an escape from every-day life by allowing people to get closer to nature	1	-3	1	0
25	There is not much point in owning your own woodland if it is opened up for public access	-3	0	1	-1
26	There are conflicts between managing a woodland for wildlife and allowing public access	0	2	2	3
28	There should be more access routes into woodland to help people visit the countryside	-1	-4	-2	-3
30	Public safety is an important consideration for woodland management	1	-1	-3	-1

Out of all the factors identified, the multifunctional owner is the least against public access (Table 8). This is the only factor that disagreed with the statement “The possibility of being sued makes me unwilling to risk public access” (-2), while all the other factors either agreed

(F2 = 2; F4 = 2) or had no opinion (F3 = 0). They also strongly disagreed that there is not much point in owning woodland if it is opened up for public access (-3), with the other factors feeling less strongly about this statement (F2 = 0; F3 = 1; F4 = -1). The multifunctional owner does not have a strong opinion on whether or not there are conflicts between wildlife and people (0), reflecting their desire to manage for multiple objectives. The other 3 factors all felt there are conflicts (F2 = 2; F3 = 2; F4 = 3). This factor is also the only one that agrees that public safety is an important consideration for woodland management (1), most likely because this is the only type of owner that either allows or is not strongly opposed to public access, so public safety must be a consideration. For those owners who do not encourage or allow access, public safety will not be an issue. One multifunctional owner (Participant 24) indicated that he would be happy to allow more access, but because his woodland is remote and not near an urban centre, this is not practical. He felt that he is penalized in terms of grant provision because of his inability to provide public access.

Factor 2 (F2): The Self-interested Owner

The self-interested owner is characterised by a strong belief that woodland owners should have the right to manage their woodland as they wish. They are not motivated by wildlife conservation, providing access, preserving the resource for the next generation or their own personal enjoyment of the woodland. Three of the participants in this study loaded significantly on this factor, and one significantly loaded negatively (Table 9). Six statements (15, 32, 20, 31, 21, 14) distinguish this factor from the other factors at a significance level of $p < 0.01$; and a further five statements (11, 29, 4, 6, 22) also distinguish this factor from the other factors at a significance level of $p < 0.05$ (Table 9).

Table 9: Salient statements for Factor 2 (+4, +3, -3, -4; * denotes distinguishing statements at $p < 0.05$; ** denotes distinguishing statements at $p < 0.01$; consensus statements are in light font)

No.	Statement	Factor score
15**	Woodland owners should have the right to manage their woodlands as they wish	4
32**	I do not have enough time to manage my woodland properly	4
1	Woodlands should be utilized more as a sustainable fuel source	3
3	Woodland owners should be rewarded for the wider benefits to society their woods provide	3
13	Woodlands are important because they help to mitigate climate change by absorbing carbon	3
11*	Applying for a woodland grant is not worth the effort	1
29*	I get a lot of personal enjoyment from my woodland	0
4*	Enough is already being done to protect and enhance the rural environment	0
6*	Multi-functional forestry – delivery social, environmental and economic benefits together – is not possible	-2
20**	Woodland owners have a duty to maintain the woodland resource for the next generation, whatever impact this has on profits	-2
31**	Owners should learn as much as possible about their woodland in order to manage it properly	-3
22*	Woodlands provide an escape from every-day life by allowing	-3

	people to get closer to nature	
21**	Through owning a woodland I have become more environmentally-aware	-3
14**	Woodland owners should protect unique or rare habitats on their land regardless of what incentives are available	-4
28	There should be more access routes into woodland to help people visit the countryside	-4

Of the four factors, the self-interested owner agreed the most strongly that woodland owners should have the right to manage their woodlands as they wish (4), with the other factors having no strong opinion on this statement (F1 = -1; F3 = 1; F4 = -1). They also disagreed strongly with the statement “Woodland owners should protect unique or rare habitats on their land regardless of what incentives are available” (-4), whereas the other factors all agreed with this statement (F1= 2; F3 = 3; F4 = 2).

The self-interested owner is also not keen on allowing more access in their woodland, strongly disagreeing with the statement “There should be more access routes into woodland to help people visit the countryside” (-4) and they do not recognise the importance of woodland in helping people get close to nature (-3). The other factors did not have a strong view on this statement (F1 = 1; F3 = 1; F4 = 0), but they did not disagree with it to the extent of the self-interested owner. Despite their reluctance to allow public access, this owner believes that woodland owners should be rewarded for the wider benefits to society their woods provide (3). F3 strongly disagrees with this statement (-4), while F1 and F4 are fairly ambivalent (1). This reflects their strong attitude towards property rights, which is not shared by the other factors. Woodland belonging to one owner which loaded heavily on this factor is located in an area with a substantial number of mine shafts, presenting a real public safety issue. For this reason, these owners are not able to allow public access. Their main management objectives are to prevent people entering the woodlands in order to protect themselves from being sued as a result of an accident. Contrary to most woodland owners, they are encouraging rhododendron growth and a dense understorey as it provides a fairly impenetrable barrier to intruders. Such woodlands have clear constraints on the type of public benefits they can provide.

The self-interested owner is constrained by both a lack of time (4) and money; see Table 10 which outlines the responses to statements relating to finance and time available for management.

Table 10: Factor array for statements relating to financial issues and time management (consensus statement in light font).

No	Statement	F1	F2	F3	F4
1	Woodland should be utilized more as a sustainable fuel source	3	3	-1	3
2	Forest owners have a greater responsibility to produce timber than to conserve the rural environment	-2	-1	-3	-3
3	Owners should be rewarded for the wider benefits to society their woods provide	1	3	-4	1

9	Market forces are more effective at stimulating woodland management than public sector schemes and regulations	0	-2	-3	1
10	If there was decent money to be made out of woodlands I would manage my woodland better	0	2	-2	2
11	Applying for a woodland grant is not worth the effort	-2	1	-1	-4
18	I do not manage my woodland to make money	-1	1	2	1
32	I do not have enough time to manage my woodland properly	-1	4	-1	-2
33	I bought my woodland as an investment	-2	-2	-4	-1
36	Woodland grant schemes really help woodland owners carry out management activities in their woods	1	-1	-1	4

Of all the factors, the self-interested owner appears to be the most constrained by time, agreeing strongly with the statement “I do not have enough time to manage my woodland properly” (4), while the other factors disagreed with this statement (F1 = -1; F3 = -1; F4 = -2). This suggests that this owner is likely to have other commitments on their time, perhaps in terms of managing a wider farm.

Self-interested owners state that they would manage their woodland better if they had the money (2), as does F4, while F3 disagrees with this statement (-2) and F1 has no opinion (0). While they do not agree that market forces are more effective at stimulating woodland management than government incentives (-2), they do believe that woodlands should be utilized more as a sustainable fuel source (3). Of all the factors, they most strongly agree that woodlands help to mitigate climate change (3) (F1 = 2; F3 = 1; F4 = 0). One owner who loaded heavily on this factor (Participant 8) indicated that the reason for planting woodland on unproductive land on their farm was to provide an alternative form of income (in the form of grant payments for new planting).

Factor 3 (F3): The Hobby Conservationist

The main thrust for this discourse is maintaining woodlands as a nature reserve and the protection of rare habitats. Seven of the participants in this study loaded significantly on this factor, six of which were also defining sorts (Table 4). Four statements (16, 1, 10, 3) distinguish this factor from the other factors at a significance level of $p < 0.01$; and a further seven statements (29, 23, 18, 15, 7, 24, 11) also distinguish this factor from the other factors at a significance level of $p < 0.05$ (Table 11).

Table 11: Salient statements for Factor 3 (+4, +3, -3, -4; * denotes distinguishing statements at $p < 0.05$; ** denotes distinguishing statements at $p < 0.01$; consensus statements are shown in italics)

No.	Statement	Factor score
16**	My main reason for owning a woodland is to maintain it as a wildlife reserve	4
29*	I get a lot of personal enjoyment from my woodland	4
23*	Woodlands have intrinsic value and should be valued for	3

	themselves and not just for what humans can get out of them	
17*	<i>Woodlands are an important element in the landscape</i>	3
14	Woodland owners should protect unique or rare habitats on their land regardless of what incentives are available	3
15*	Woodland owners should have the right to manage their woodlands as they wish	1
7*	The possibility of being sued makes me unwilling to risk public access	0
24*	The local community benefits from my woodland	0
11*	Applying for a woodland grant is not worth the effort	-1
1**	Woodland should be utilized more as a sustainable fuel source	-1
10**	If there was decent money to be made out of woodlands I would manage my woodland better	-2
30	Public safety is an important consideration for woodland management	-3
9	Market forces are more effective at stimulating woodland management than public sector schemes and regulations	-3
2	<i>Forest owners have a greater responsibility to produce timber than to conserve the rural environment</i>	-3
33	I bought my woodland as an investment	-4
3**	Woodland owners should be rewarded for the wider benefits to society their woods provide	-4

The hobby conservationists indicated that maintaining their woodland as a wildlife reserve is the main reason for their ownership of woodland (4). This contrasts with the other three factors, which indicated either ambivalence (0) towards this statement (F2), or some degree of disagreement or less agreement (F1 = -1, F4 = -2).

Out of all the factors, F3 is the least motivated by or concerned about money. This is reflected in the factor arrays for the statements relating to financial issues (Table 10), in turn suggesting that the hobby conservationist is not constrained by money and is likely managing woodland as a hobby. This was the only factor that disagreed with the statement "If there was decent money to be made out of woodlands I would manage my woodland better" (-2), with both the self-interested owners and the custodians agreeing with this statement (2) and the multifunctional owners remaining ambivalent (0). The qualitative interviews suggest that the reason for this response may be that these owners believe they are already managing their woodlands adequately, so do not see that money could enhance such management. Furthermore, the hobby conservationists strongly disagreed that they bought their woodland as an investment (-4), while the other factors disagreed with this statement to a lesser extent (-2 for F1 and F2; and -1 for F4). Hobby conservationists do not express a strong opinion on whether woodlands should be utilized more as a sustainable fuel source (-1), whereas all three other factors agreed strongly with this statement (3). This may be because other factors perceive potential income benefits from utilizing their woodlands as a fuel source. This lack of concern for financial return is also reflected in the hobby conservationists strong disagreement that woodland owners should be rewarded for the wider benefits to society that their woods provide (-4), while the disinterested owners agreed with this statement (3) and the multifunctional owners and custodians agreed, but to a lesser extent. One hobby conservationist (Participant 9) said that owning a woodland is altruistic, so owners should not

expect to be rewarded.

The hobby conservationists may also not feel they need to be rewarded for the benefits their woodlands provide because they get a lot of personal enjoyment from managing their woodland (4), as does the multifunctional owner (4), while the self-interested owner (0) and the custodians (1) do not have a strong opinion on this statement. A lack of time is also not a problem, as this owner is likely to be able to afford to pay for contractors to carry out the work or they may be retired and have plenty of time to do the work themselves.

This discourse, although not in strong opposition to public access, does not encourage it. They believe that there may be a conflict between protecting wildlife and allowing public access (2). The scores for statements relating to access are towards the centre (2 to -2) since access is not a motivation for their management, therefore, they do not perceive statements relating to access as relevant to them.

From the qualitative interviews, four out of the seven participants that loaded heavily on this factor are “new” woodland owners. In other words, they have no previous experience of woodland ownership or land management.

Factor 4 (F4): The Custodian

The main objective for this discourse is maintaining and protecting the woodland resource for the next generation. For the custodian owner time is not an issue, but money is and they rely heavily on grants to carry out the management work in their woodlands. Four of the participants in this study loaded significantly on this factor, three of which were also defining sorts (Table 12). Three statements (36, 5, 11) distinguish this factor from the other factors at a significance level of $p < 0.01$; and a further four statements (29, 20, 13, 23) also distinguish this factor from the other factors at a significance level of $p < 0.05$ (Table 12).

TABLE
Salient statements for Factor 4 (+4, +3, -3, -4; * denotes distinguishing statements at $p < 0.05$; ** denotes distinguishing statements at $p < 0.01$; consensus statements are shown in italics)

No.	Statement	Factor score
36**	Woodland grant schemes really help woodland owners carry out management activities in their woods	4
20*	Woodland owners have a duty to maintain the woodland resource for the next generation, whatever impact this has on profits	4
1	Woodland should be utilized more as a sustainable fuel source	3
17	<i>Woodlands are an important element in the landscape</i>	3
26	There are conflicts between managing a woodland for wildlife and allowing public access	3
29*	I get a lot of personal enjoyment from my woodland	1
5**	Sport shooting is a strong motivation for me to manage my woodland	1
13*	Woodlands are important because they help to mitigate climate change by absorbing carbon	0
23*	Woodlands have intrinsic value and should be valued for	-1

	themselves and not just for what humans can get out of them	
2	<i>Forest owners have a greater responsibility to produce timber than to conserve the rural environment</i>	-3
24	The local community benefits from my woodland	-3
28	There should be more access routes into woodland to help people visit the countryside	-3
11**	Applying for a woodland grant is not worth the effort	-4

The custodian strongly agrees that woodland owners have a duty to maintain the woodland resource for the next generation, whatever impact this has on profits (4). Although F1 and F3 agree with this statement (2), they do not rank it as high as F4. The self-interested owner is the only factor which disagrees with this statement (-2).

The participants that loaded significantly on this factor were either farmers (3 participants) or traditional estates (1 participant). They may have estate workers or family labour and so, of all the factors, are the least constrained by time (-2). They are, however, limited by money in terms of what management can be carried out. They agree with the self-interested owners that they would manage their woodlands better if there was decent money to be made from them (2), in stark contrast to the hobby conservationists who do not agree with this statement (-2). The custodian owner appears to be the most supportive of government incentives and grant schemes, disagreeing very strongly with the statement that "Applying for a woodland grant is not worth the effort" (-4) and agreeing very strongly that "Woodland grant schemes really help woodland owners carry out management activities in their woods" (4), whereas the other factors felt less strongly about both statements (F1= -2 and 1; F2 = 1 and -1; F3 = -1 and -1, respectively). However, even though the custodian does not think that woodland owners have a duty to produce timber than to conserve the rural environment (-3), they do believe that woodlands should be utilized more as a sustainable fuel source (3).

The custodian owner is against more public access in woodlands, as can be seen by the factor array for the statements relating to access and public use of woodlands (Table 8). This group is wary of allowing public access due to the possibility of being sued. They do not believe that there should be more access routes into woodland (-3), neither do they think that the local community benefits from their woodland (-3) or that the more the wood is used by local people the more it is valued (-2). This reluctance to allow access could stem from their belief that there are conflicts between wildlife and public access (3), even though they indicate that they do not own their woodland to maintain it as a wildlife reserve (-2). Alongside this, some of the custodian owners are likely to manage their woodlands for sport shooting, so there may be conflicts with access. Custodians were the only group to indicate that sport shooting was somewhat of a motivation for management (1). All of the other groups disagreed that they managed for shooting (F1 = -3; F2 = -1; F3 = -2).

DISCUSSION

The analysis of the data collected using a Q methodological approach identified four significant factors, each factor representing a group of individuals who sorted the 36 statements in a way that statistically distinguishes them from the other factors. An interpretation of the factor arrays and distinguishing statements suggests four classifications of woodland owners: the multifunctional owner, the self-interested owner, the hobby conservationist and the custodian. These owner types are further discussed with regard to

their likely response to state incentive schemes.

'Hobby Conservationists' are the least motivated or constrained by money, they are not interested in making a profit from their woodlands or harvesting wood products, including wood fuel. Hobby conservationists do not wish to encourage more public access in their woods as they believe there is a conflict between people and wildlife. This group of owners manage their woodland as a hobby and most appear to have both the time and money to do this adequately. Thus, it is unlikely that they will be attracted by grant incentive schemes to encourage public access. Indeed, it could be argued that public funds should not be used to subsidize a group of owners that would carry out the required management of their own free will.

'Custodians' are the most supportive of and reliant upon grant incentives, despite their reluctance to increase access in their woodlands. This owner type is dominated by farmers and traditional estate owners, so the area of woodland they own is often relatively large, making applying for grants more cost effective and beneficial to them. Since much of their income comes from their land, the custodian owners would like their woodlands to pay for themselves. Government schemes to stimulate a viable and sustainable wood fuel market are likely to encourage these owners to manage their woodlands better, enhancing the opportunities for public benefit provision. A study by Slee *et al.* (2006) concluded that moderate levels of woodland management for timber or wood products increases the public benefit opportunities (e.g. wildlife, recreation, landscape) in woodlands.

While 'Self-interested owners' believe that woodland owners should be rewarded for the wider benefits to society their woods provide, they do not find the grant system supports them in the way they need. This may be because they are also constrained by time and do not have the time to fill out the application forms. Or, as the qualitative interviews suggest, they do not want to be told how to manage their woodlands. They feel strongly that they should be able to manage their woodlands as they wish, and perceive involvement in grant schemes as a constraint on their freedom and rights. This type of owner does not wish to encourage more access. While the hobby conservationist is opposed to increased access on the grounds of the potential conflicts between people and wildlife, the self-interested owner does not encourage access due to their strong views on property rights. This owner type is unlikely to be encouraged to manage their woodland better through grant incentives, but would be motivated to manage their woodlands if it was financially profitable. As with the custodian owners, the self-interested owner is likely to be encouraged to increase public benefits provision in their woodlands through the development of a sustainable wood fuel market. However, this would need to be encouraged on a sustainable basis and not merely for private gain.

'Multifunctional' owners are the most pragmatic of the four owner types identified in this study. They are keen to finance their woodland management through both grant schemes and through the sale of wood products, especially wood fuel. This group of owners is the most likely to embrace incentives to enhance the recreational public benefits of their woodlands and do not perceive any conflict between people and wildlife. Not only do they appreciate the social, emotional and health benefits that access to woodlands can have on people and communities, some multifunctional owners actively encourage access, either through informal permissive paths, or more formally, managing their woodland as a visitor attraction with

entrance fees contributing towards management costs. As entrepreneurs, they are keen to identify ways to improve the social, environmental and economic outputs of their woodland and are likely to be the most amenable to grant support for public benefit management.

CONCLUSIONS

This study used Q Methodology to develop a classification of private woodland owners in England. Four types of owner emerged, with distinct objectives for woodland ownership and management. While the results indicate that grant incentive schemes are attractive to some types of woodland owner, such as the custodian owner and the multifunctional owner, other owner types (e.g. hobby conservationists, self-interested owners) may need other incentives to deliver public policy objectives. It may well be that a suite of grant incentives needs to be developed to cater for the varying aims and objectives of woodland owners, with some grants offered for woodland management such as habitat enhancement and others for recreational access, alongside government investment in programmes to encourage and facilitate the development of a viable wood fuel and product market.

While Q Methodology provided a useful tool in developing the typology of woodland owners, the method is not without its limitations. Although the approach is time-consuming for the researcher, it has the benefit of not requiring a large sample of participants. However, the small sample of participants means that inferences about the wider population cannot be made, since the distribution of the sample is non-random. While the method can reveal certain perspectives or discourses, it cannot be used to ascertain the proportion of the wider population that hold those views. Nevertheless, it can assist in environmental policy-making by identifying the perceptions of people on a particular issue, and it can reveal the differences between groups. Such an understanding can assist in determining which policies are likely to gain support and from whom.

In order to gain a deeper understanding of the distribution of these owner types, a large-scale structured survey using random sampling techniques should be undertaken. This would allow the distribution of these owner types, in terms of proportion of individuals and area of woodland, to be estimated. Such statistics would prove useful in ascertaining whether any particular owner type dominates the private woodland sector and, to help clarify the group that would best provide a focus for grant incentive schemes.

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