The Value of Coastal Access: A Case Study of the Norfolk Coast Path

(Norfolk County Council, 2017).

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1. Abstract

Local authorities around the UK are responsible for the management and maintenance of the natural environment, including recreational spaces such as walking trails. However, efficient management of these spaces requires an understanding not only of the costs of maintenance but also of the benefits derived. Valuing the benefits from natural ecosystems is challenging, and these ecosystems are therefore often undervalued. This thesis looks at the case study of the Norfolk Trails, a countryside access team within Norfolk County Council, who have lacked suitable methodologies to fully estimate the value of their walking trail network. As such, the economic value of their trails has been underestimated, which has negative implications for their decision-making or for funding applications. Environmental economics provides a suite of non-market valuation tools that can be employed to reset the balance. As this thesis coincides with the England Coast Path Scheme, contingent valuation and travel cost methods are used to identify the economic value of Norfolk's newest stretch of coastal access, constructed as part of the scheme. Travel cost and contingent valuation methodologies were employed, estimating values of £3.29 and £3.09 per visit respectively. Each value was combined with an average user spend of £20.90 per visit, and fed into a cost-benefit analysis. Results showed the aggregate benefit of the trail outweighs construction costs 26 times in the first year since launch. The findings and implications from this study, specifically as a framework for Norfolk Trails to follow, are then discussed. The need for future studies to incorporate multiple methodologies was concluded.

Keywords: Contingent valuation, travel cost, non-market valuation, recreation, England Coast Path, cost-benefit analysis.

Contents

2. Introduction

2.1 The England Coast Path Scheme

Under the Marine and Coastal Act of 2009, new rights of coastal access were established. A duty was placed on the Secretary of State and Natural England (NE) to secure a route for the whole of the English coast, along which the public can make recreational journeys. For context, NE is a non-departmental public body responsible for protecting and improving the natural environment. The England Coast Path (ECP) is being created as a result of this legislation, combining pre-existing public rights of way (PROW) and newly created access (Gov.uk, 2018a). On 29th June 2012 the first stretch, 32km from Portland to Lulworth Cove was opened to the public (Gov.uk, 2017a). On 24th October 2017, Norfolk followed suit with its second stretch, 34km from Sea Palling to Hopton-on-Sea (Figure 4) (Gov.uk, 2017b). This thesis will focus on this stretch, henceforth referred to as ECPS2.

Human beings, as welfare maximising agents, attach positive economic values to non-market goods and services, which the coast provides (Wilson *et al.*, 2005). It is therefore recognised that coastal recreational activities have the potential to deliver significant economic benefit to rural areas, and thereby support rural diversification, innovation and regional development (Barry *et al.*, 2011). In view of this, policy makers worldwide have introduced a number of initiatives to enhance coastal resources, such as the Marine and Coastal Act of 2009 discussed above. However, there are surprisingly few empirical studies quantifying the economic benefits associated with coastal recreation, with many previous studies focusing on the recreational value of agricultural land, forests, or protected areas (Barry *et al.*, 2011). Furthermore NE publications (2013) frequently refer to "recreational benefit" however this is never quantified. Hence, the impact that ECPS2 may have on the economy, whether it will bring about enough economic benefit to make the effort and expenditure worthwhile, is unknown. Moreover, stretches 3 and 4 of ECP in Norfolk, 60km from Hunstanton to Weybourne, and 53km from Sutton Bridge to Hunstanton respectively, are in the planning stages. It would be appropriate to identify the value gained from prior stretches, to inform any planning and decision-making for these subsequent stretches.

2.2 Norfolk Trails Management

The Norfolk Trails (NT) comprise a network of over 1,900km of walking, cycling and bridle routes, including the Norfolk Coast Path and its newest stretches (Figure 1). Funding is sourced from external projects to support the vast majority of these trails and their maintenance (personal communications, 2017). Although NE supplied the funding to develop ECPS2, they have not and will not supply any funding for its maintenance and upkeep (*ibid.*).

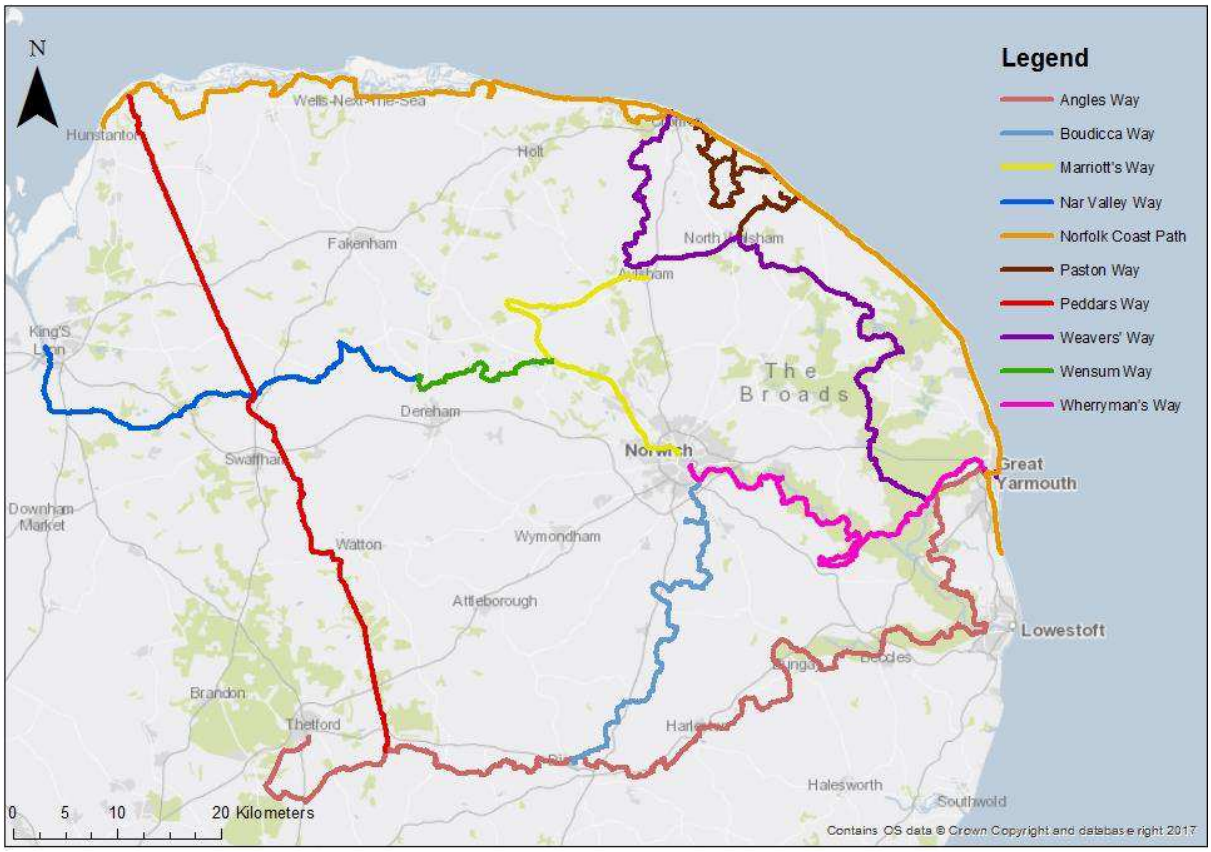

Figure 1: The Norfolk Trails network (produced in ArcMap).

The NT team, part of the Environment Team at Norfolk County Council, lack adequate information regarding the value of their trails (personal communications, 2017). They therefore lack a basis to inform their decision-making, and the ability to convey the importance of their trails to funding providers. Realising the true value of their trails will provide an advantageous tool to aid this decision-making, and furthermore can support and justify applications to administrative bodies, to fund future maintenance (Oh and Hammitt, 2010).

Moreover, the team lack an appropriate method in which to identify the value of their trails. Self-registration surveys currently administered (Appendix 1) look at user spend, to estimate the economic impact. However, by only looking at the economic impact, the economic benefit is excluded and as such the recreational trails are undervalued (Section 3.2). NT also use the Monitoring Engagement with the Natural Environment (MENE) report to help estimate the value of their trails (Natural England, 2016). This produces inaccurate results, due to the MENE report's analysis of 'days out' instead of the value of access to greenspace. Furthermore, feedback from meetings with partners and stakeholders often suggests that the value of these trails are much higher than estimated. The need for an appropriate method to calculate the value of the trail becomes clear, and this thesis could provide a framework to NT such that they can conduct the same research for their other trails.

2.3 Research Aims

1. To identify an appropriate methodology for NT to estimate the recreational value of their trails;
2. To test this proposed method with ECPS2;
3. To employ cost-benefit analysis to determine whether construction of ECPS2 was worthwhile in economic terms.

3. Literature Review

3.1 Outdoor Recreation

Walking, rambling and day hiking in natural areas are some of the most popular forms of outdoor recreation (Bennett et al., 2003; Oh and Hammitt, 2010). Studies suggest that recreational visits to the natural environment, and specifically coastal areas, are increasing (Bennett *et al.*, 2003; Cordell, 2004; Oh and Hammitt, 2010; Barry *et al.*, 2011; Natural England, 2017). Increased affluence, urbanisation, and changing values are contributing to this increased demand (Barry *et al.*, 2011).

Recreational trails provide a variety of benefits to users, including the opportunity for exercise, nature enjoyment, and spending time with family and friends (Bowker *et al.*, 2007; Oh and Hammitt, 2010). Furthermore, recreational trails provide benefits to communities by providing a place for local people to gather and relax, and by attracting tourists who spend money in the local economy (Bowker *et al.*, 2007). It is because of these such benefits that government agencies and local government authorities provide walking trails through the PROW network. Some parts of this network are linked to form the 16 National Trails (Bennett *et al.*, 2003), of which the ECP will become part of when completed (National Trails, 2017). The National Trails span nearly 4,000km, with another 4,500km as part of the ECP (*ibid.*).

One of the best ways to improve the value of coastal resources is through the provision of walking trails (Barry *et al.*, 2011). These not only provide a valuable source of recreation to the public but also increase access to the coastline (*ibid.*). For example, as part of ECPS2 construction, a boardwalk was built onto the beach at North Denes, allowing users who may have otherwise been unable to access the beach (Eastern Daily Press, 2017).

3.2 Economic Impacts and Economic Value

Economic impacts, in the context of this study, can be defined as the net economic change in a host community that results from spending attributed to ECPS2 (Turco and Kelsey, 1992; Crompton, 1995; Bowker et al., 2007). Total economic impacts are composed of the direct, indirect and induced effects (Crompton, 1995; Bowker *et al.*, 2007). The direct effects represent the initial spending by tourists in the local economy, for example the money that might be spent on food, accommodation, and transport (*ibid.*). The “ripple effect”

expenditures made by business sectors to meet tourist demands for goods and services are the indirect effects (*ibid.*). As household incomes and expenditures grow, additional economic activity is stimulated, representing the induced effects (*ibid.*). The idea of economic impacts link to the multiplier effect (Crompton, 1995). Economic impacts can be estimated through a number of techniques, such as the Impact Analysis for Planning (IMPLAN) model, which has been widely applied in the context of tourism and recreation (Bergstrom *et al.*, 1990; English and Bowker, 1996; Loomis and Caughlan, 2006).

Economic value on the other hand, although defined differently by the different schools of thought within economics, can be thought of generally as the innate worth of the commodity, which determines the normal ratio at which two commodities exchange (Keen, 2001). This does not exactly reflect the market price, because consumer and producer surpluses also contribute to economic value (Fisher *et al.*, 2015). Consumer surplus (CS) is defined as the amount by which an individual's willingness to pay for a good exceeds what the individual must pay for the good (Bowker *et al.*, 2007; Fisher *et al.*, 2015). Producer surplus (PS) is defined as the difference between the amount a producer receives and the minimum amount the producer is willing to accept for the good (Fisher *et al.*, 2015). These surpluses are illustrated in Figure 2. In the absence of market prices, CS is accepted for use in economic efficiency analysis and cost-benefit analysis (Pearse and Holmes, 1993).

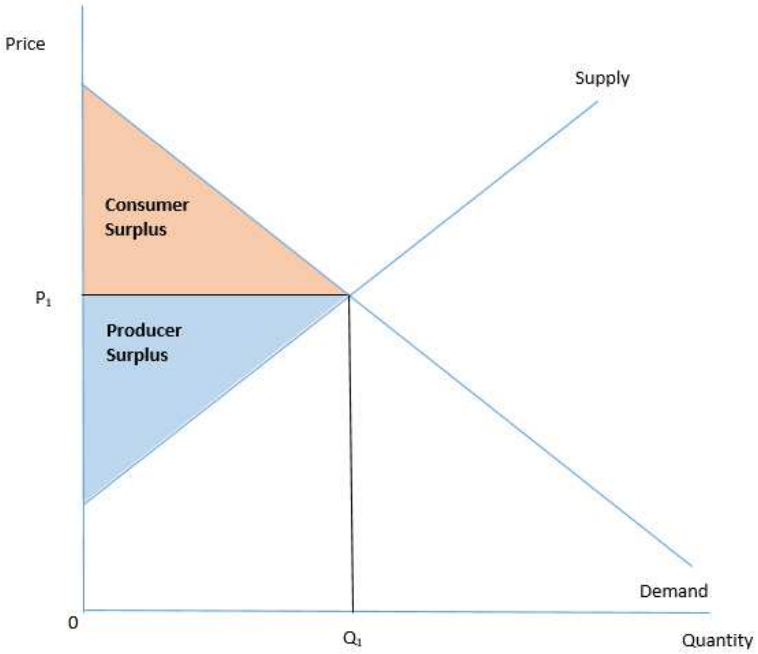

Figure 2: Simple supply and demand curves used to show producer and consumer surplus (drawn by author).

Literature review has highlighted a disconnection between the academic world, and application by those who manage recreational spaces. Academia focuses on estimations of the economic benefit of recreational spaces, but often ignore the economic impacts, whereas those managing the spaces tend to focus only on the economic impacts and not on the benefits. This occurs not only with NT but with South West Coast Path, Wales Coast Path, and the Ramblers, Britain's walking charity, outlining the broader application of this research (southwestcoastpath.org.uk, 2014; walescoastpath.gov.uk, 2015; ramblers.org.uk, 2018).

3.3 Cost-Benefit Analysis

Cost-benefit analysis (CBA) is a procedure for evaluating the social worth of investment projects and policy (Pearce, 1998), and has become a tool widely used for analysis across the globe (Hanley, 2001; Pearce *et al.*, 2006). The idea has become particularly pertinent with government use of scarce public resources (Asafu-Adjaye, 2000; Hanley, 2001), resulting in a number of legislative bodies including the European Commission and HM Treasury creating documents outlining rules for best practice (European Commission, 2014; Gov.uk, 2016a).

The basis of CBA are as follows; any costs and benefits of said proposal, defined as losses and gains in human well-being respectively, are identified and measured (Pearce, 1998). Only those projects where the benefits are in excess of the costs are deemed economically acceptable (Griffin, 2008). Importantly, CBA should include the opportunity cost, or the benefit that is lost from other projects that would otherwise have been financed (Figure 3) (Gov.uk, 2016a; Fisher *et al.*, 2015).

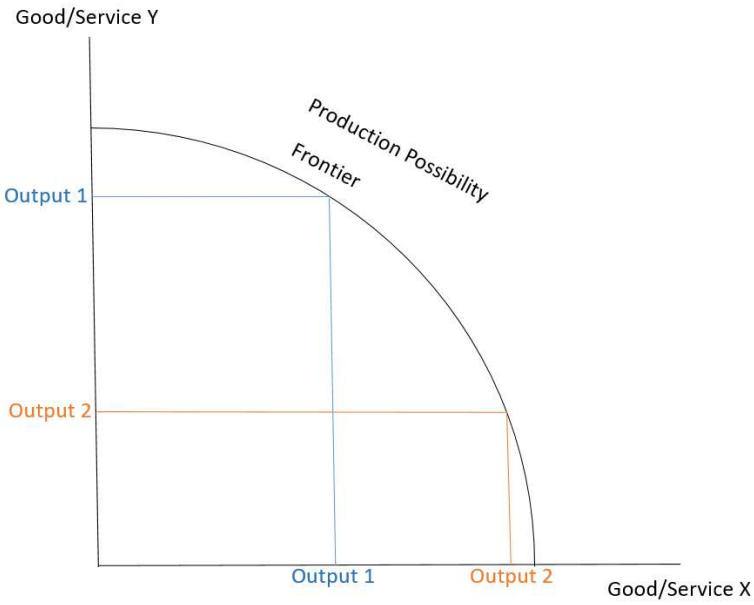

Figure 3: The basic concept of opportunity costs. The opportunity cost of achieving output 1 is what could have been achieved with output 2 (drawn by author).

However, ethical concerns surrounding CBA do exist. Notably, CBA fails to look at who the costs or benefits are accrued by (Srinivasan *et al.*, 2008; Fisher *et al.*, 2015). Although, the Green Book by HM Treasury (Gov.uk, 2016a) does specify that distribution of costs and benefits should be taken into account. Hence these concerns may begin to diminish as distribution considerations become commonly practiced.

Further concern surrounding the use of discounting also exists. Economic analysis tends to assume that a given unit of benefit or cost matters more if it is experienced now than in the future (Pearce and Turner, 1990; Pearce, 1998). Hence, cost or benefit values accrued in the future are often discounted, and typically diminished (Fisher *et al.*, 2015). The use of discounting in CBA therefore often favours decisions that are unfair to future generations (*ibid.*). Hence use of discounting in CBA faces criticism, with literature citing "the tyranny of discounting," (Atkinson and Mourato, 2015) or "discrimination against of the future," (Pearce and Turner, 1990). Some suggest discounting raises ethical implications, and others argue the assumption that society as a whole will act like a given individual is deeply flawed (Fisher *et al.*, 2015). Considerable debate therefore exists in the literature surrounding whether cost or benefit values should be discounted at all, or the discounting rate to be used (Arrow *et al.*, 2013; Atkinson and Mourato, 2015).

Despite these controversies, some argue that CBA is a better decision-making tool than the alternatives (Hsu and Loomis, 2002), and is still widely used by British and European governments.

3.4 Why Value Nature

Understanding the economic value of nature and the services it provides to humanity has become one of the most significant and fastest evolving areas of research in environmental economics (Turner *et al.*, 2003). Much of the need for nature valuation comes from decision-making by government and business alike using CBA (Turner *et al.*, 2003; Parsons, 2013; Fisher *et al.*, 2015). Anything without a monetary value, such as environmental benefits, would otherwise be left out of CBA and given a *de facto* value of zero (Loomis *et al.*, 2000; Losey and Vaughan, 2006; Kong *et al.*, 2007; Fisher *et al.*, 2015).

The debate over what value resides in nature is, at the core concept, complex and multidimensional (Turner *et al.*, 2003). Ecosystem valuation can be combined with an

ecosystem function approach (*ibid.*) resulting in a school of thought known as ecosystem goods and services (Fisher, 2009). The model has become so important that it has led to the creation of the Millennium Ecosystem Assessment (MEA) (2005), a framework for valuation assessment to aid decision-making. However, the ecosystem services concept causes some controversy, most notably surrounding the heavy anthropocentric focus (Brown *et al.*, 2007). Some argue that conserving the planet's biodiversity is an end in itself, a moral imperative that does not require economic justification (Fisher *et al.*, 2015). The methodology is also criticised for a number of flaws, including issues surrounding marginality, double counting, and typological issues (Turner *et al.*, 2003; Pagiola *et al.*, 2004; Morse-Jones *et al.*, 2011).

The ideas of existence values follows, also referred to as bequest value, intrinsic value, passive-use and non-use values (Carson, 2000). Definitions trace back to Krutilla (1967), who suggests "there are many persons who obtain satisfaction from mere knowledge that part of wilderness … remains even though they would be appalled by the prospect of being exposed to it." Without the inclusion of existence values, pure public goods, those which are non-rival and non-excludable, have little or no measured economic value (Carson, 2000). These pure public goods are typically provided by the government, and can include air quality, national defence or areas for outdoor recreation such as coastal trails (*ibid.*).

3.5 Non-Market Valuation Techniques

Assessing the economic value of some public goods, such as walking trails, cannot be accomplished using traditional market-based studies due to the absence of market prices (Oh and Hammitt, 2010). As such, non-market valuation methodologies must be employed, which refers to a suite of techniques that can estimate the value of goods and services that do not pass through established markets (Fisher *et al.*, 2015). These methods are often divided into stated preference (SP) and revealed preference (RP) techniques. The RP approach makes use of market decisions to infer value for goods and services not exchanged in the market place (Ward and Beal, 2000), whereas SP techniques elicit how respondents would behave given a specific hypothetical situation (Oh and Hammitt, 2010). RP is often considered more reliable than SP, as studies actual behaviours as opposed to hypothetical questions (Fisher *et al.*, 2015). However, RP does not elicit the exact values one wishes to study, and instead rely on other markets which may reflect complex drivers (*ibid.*).

3.5.1 Hedonic Pricing

Hedonic pricing, an RP technique, refers to valuation methods that decompose a good or service into the component attributes that define its value, and is most frequently applied to the real estate market (Fisher *et al.*, 2015). Hedonic models therefore use properties as proxies to quantify environmental amenities (Kong *et al.*, 2007). Green spaces produce benefits that can make a neighbourhood a preferable place to live, which is often reflected in higher house prices (Tyrvainen, 1997; Kong *et al.*, 2007). Regression analysis is then conducted to determine the relative contribution of each characteristic to property value (Fisher *et al.*, 2015). The technique has received increasing attention since a statistically significant relationship between air quality and house prices was identified (Ridker and Henning, 1967).

3.5.2 Travel Cost Method

Travel cost models, an RP methodology, have been widely used to determine the environmental value of recreational resources (Kong *et al.*, 2007; Fisher *et al.*, 2015). The method relies on two basic premises. Firstly, time and travel expenses that people incur to visit a site represent the "price" of access to that site (Kong *et al.*, 2007; Fleming and Cook, 2008; Bertram and Larondelle, 2017). In this way, consumers reveal their willingness to pay for recreational use of the environment (Parsons, 2013). Secondly, that preferred places will have more visitors and crucially, more visitors from further away (Fisher *et al.*, 2015; Bertram and Larondelle, 2017). The technique has been employed since Harold Hotelling famously suggested the method to the director of the National Park Service in 1949 (Parsons, 2013).

The general travel cost demand curve is typically specified as:

$$TRIPS = f\,(TC, SC, INC, SE, TP, OTH) + u \qquad (1)$$

where TRIPS is the annual number of primary purpose trips to a recreation site; TC is the travel cost per trip; SC is the cost of visiting a substitute site; INC is the annual income; SE is a vector of socio-economic variables; TP is a vector of taste and preference variables that could include activity preferences; and OTH is a vector that could include site quality indicators (Bowker *et al.*, 2007). The variable u is used to account for random error (*ibid.*). With regression analysis, the demand function can be estimated and, in turn, a

measurement of CS (Fleischer and Tsur, 2000; Parsons, 2013). In this format, the results of TC studies can then easily be compared to other valuation estimates.

However, a number of issues can cause complications in the estimations and interpretation of TC studies. These include multipurpose or overnight trips, where all of the travel costs incurred no longer exclusively apply to a single site (Fleming and Cook, 2008; Parsons, 2013). These trips can be excluded from analysis (Parsons, 2013; Bertram and Larondelle, 2017), or respondents can be asked to estimate, of their enjoyment of the overall trip, what proportion they would attribute to time spent at the recreational space being valued (Fleming and Cook, 2008). Other complications include people travelling together in the same vehicle, inclusion of overseas visitors, and the significant debate surrounding the opportunity cost of time (Flemming and Cook, 2008; Parsons, 2013).

3.5.3 Contingent Valuation

Contingent valuation (CV) is the most prevalent method used to estimate the economic value for environmental goods (Price, 2000; Zhongmin *et al.*, 2003; Kong *et al.*, 2007; Richardson and Loomis, 2009). The concept at its core being relatively simple; if you want to know how much something is worth, go to those who value it and ask (Bennett and Tranter, 1997; Price, 2000). It therefore involves the direct questioning of people to elicit their valuations of the good or service by asking them for their willingness to pay (WTP) by means of posing hypothetical markets (Bennett and Tranter, 1997).

The CV method does face criticism, largely surrounding the reliability and validity that can be drawn from hypothetical scenarios (Cummings *et al.*, 1986; Carson *et al.*, 2001; Oh and Hammitt, 2010). Despite this, Johnston *et al.*, (2017) argue that the need for information on economic values in the absence of market choices leads to an unquestionable demand for CV survey estimates.

A vast CV literature exists, often debating the technical problems (Bennett and Tranter, 1997; Price, 2000). For example, it has become standard practice in CV research to use dichotomous choice models (Kanninen, 1993), particularly following the strong recommendation of the format in the report of the US National Oceanic and Atmospheric Administration Panel on CV (Arrow *et al.*, 1993). It is overwhelmingly recommended as the 'take it or leave it' approach is similar to the market, as such participants are used to

thinking in this way and seeing market decisions in this format (Teasley *et al.,* 1994; Kanninen, 1993). Furthermore, the use of open-ended questions often results in a large number of respondents who provide either unrealistically high or zero WTP estimates (Johnston *et al.*, 2017). Other literature debate the use of mean or median WTP in analysis (Harrison and Kristrom, 1995), how to design surveys to ensure incentive compatibility, the incentive for respondents to truthfully reveal their preference (Carson *et al.*, 2014; Johnston *et al.* 2017), or the mode of survey administration (Carson *et al.*, 2001).

Although CV has been used frequently to estimate the value of recreational spaces, it has also been employed with much wider applications, for example the technique was famously used by the Alaskan government to place a monetary value on the damages caused by the Exxon Valdez oil spill of 1989 (Carson *et al.*, 1992). It has also been used to estimate the WTP for climate change mitigation targets (Uehleke, 2016), to estimate consumers WTP for animal welfare legislation (Bennett and Blaney, 2003) or to estimate WTP for road traffic noise controls (Moncayo *et al.*, 2017).

Despite CV being the only methodology able to estimate existence values (Loomis *et al.*, 2000; Carson *et al.*, 2001; Johnston *et al.*, 2017), the existence value has frequently been excluded from CV studies of outdoor recreation (Bennet *et al.*, 1995; Bennett *et al.*, 2003; Oh and Hammitt, 2010). This may be due to the debate that surrounds the existence value concept (Turner *et al.*, 2003).

3.5.4 Choice Experiments

Choice experiments (CE) are another example of an SP method of non-market valuation. In CE, respondents are presented with a set of choices made up of alternative outcomes from which they are asked to select the preferred outcome (Morris *et al.*, 2009). Each alternative is described by various levels of a set attribute (Horne *et al.*, 2005). CE are particularly pertinent when a range of scenarios exist and when the non-market good can be valued by several attributes (Rolfe and Windle, 2013). Crucially, CE must include a status quo option, which sets the baseline for economic welfare analysis (Carson *et al.*, 1994). Choice models can then be estimated and statistical analysis carried out (Horne *et al.*, 2005).

CE have been frequently used nature valuation (Horne *et al.*, 2005; Birol *et al.*, 2006; Rogers, 2013) but can also be employed in a much wider range of contexts. For example, CE have

been used to determine preference for a place of child delivery in Tanzania (Kruk *et al.*, 2011), to study consumer preferences with organic and locally grown produce (Yue and Tong, 2009), and to assess the determinants of local acceptability of wind-farm investment (Dimitropoulos and Kontoleon, 2009).

3.5.5 Identification of Appropriate Technique

The CV and TC methodologies were both identified as suitable for this study. As such, both an RP and an SP methodology has been employed.

CV was identified for three reasons. Firstly, based on the recommendation of Johnston *et al.* (2017), who argue it is the preferred method for value estimations of public goods such as trails. Secondly, due to the relative ease with which the more straightforward approaches, such as mean WTP, can be analysed. This only requires analysis with Microsoft Excel, so is suited to potentially limited resources afforded to future studies by NT. Finally, CV can be specifically designed to estimate recreational values in the form of entrance fees. This is appropriate as NT measure the number of users who walk along their trails annually with people counter posts, so the two figures can easily be multiplied to estimate an annual aggregate benefit, similar to studies by Bennett *et al.*, (1995), Bennett and Tranter (1997), Bennett *et al.* (2003), or Oh and Hammitt (2010).

The TC was identified due to the relative ease with which it could be implemented by NT in future studies, as the self-registration surveys they currently administer (Appendix 1) already note where along the trail the survey was administered, and ask for respondent's postcode. Furthermore, the more straightforward approaches to the TC do not require any environmental economics or statistical expertise, and can be analysed using Microsoft Excel. Again, this is suited to limited time and monetary resources that NT may afford future studies.

CV and TC can calculate the 'use' value of the trail, which stem from tangible consumption of an environmental resource (Pearce and Turner, 1990). In this context, the use value is henceforth referred to as the recreational value (Hsu and Loomis, 2002).

In another area, perhaps the more densely housed areas of the Thames Estuary in which ECP construction will soon begin, it would be interesting to use hedonic models to

investigate the value of ECP. If future studies are afforded greater resources, it would also be interesting to employ CE.

4. Methodology

4.1 Case Study

ECPS2, 34km long spanning from Sea Palling to Hopton-on-Sea, can be seen in Figure 4. The route passes through areas recognised and protected for their landscape value, specifically the Norfolk Coast Area of Outstanding Natural Beauty (Landscapeforlife.org.uk, 2018). The coast is described as an "undulating, intimate landscape under huge skies," attracting many day and weekend visitors (*ibid.*).

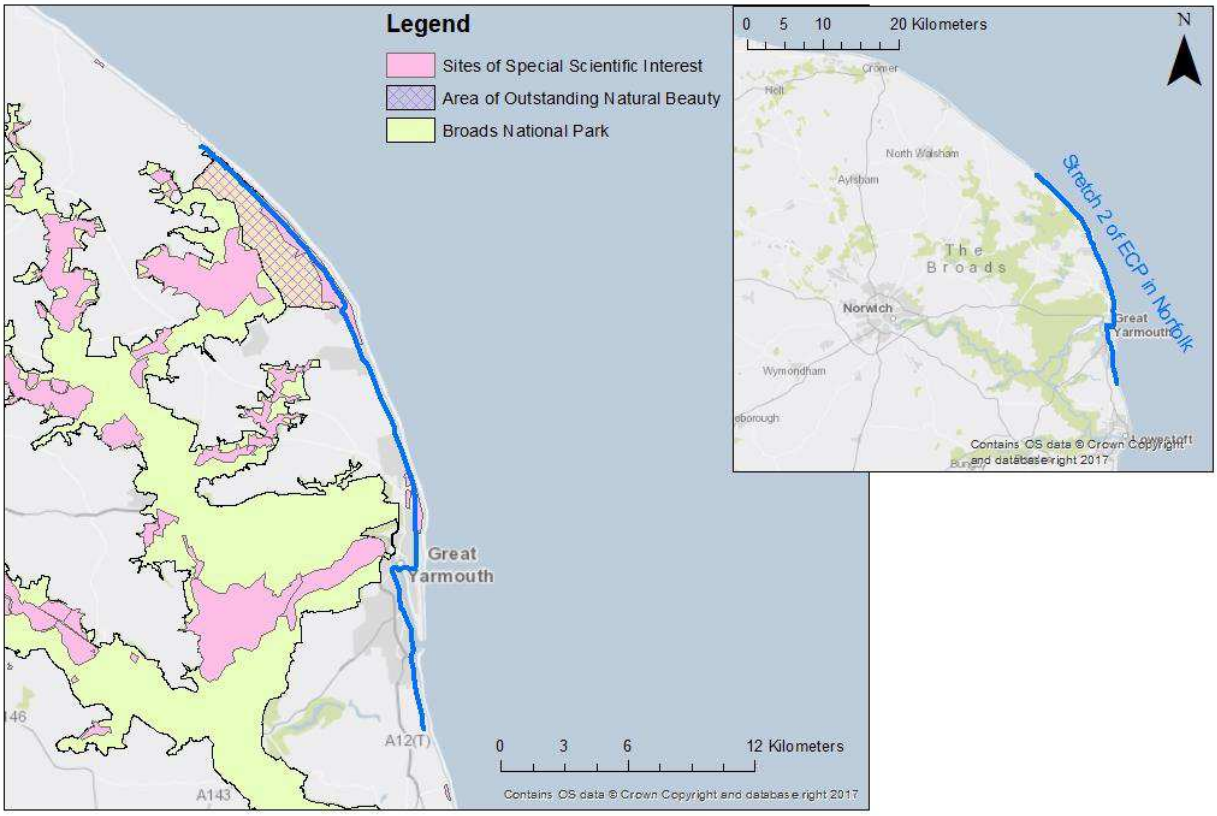

Figure 4: ECPS2, shown to pass through the Broads National Park, an Area of Outstanding Natural Beauty and a number of Sites of Special Scientific Interest (produced in ArcMap).

Much of the route is of unique scientific and ecological value, passing through a number of designated areas including the Winterton-Horsey Dunes SSSI, also a Special Area of Conservation (Natural England, 2018a), the Winterton Dunes National Nature Reserve (Gov.uk, 2008), and the Great Yarmouth North Denes Special Protection Area (Natural England, 2018b). These areas hold such internationally important designations due not only to the embryonic dune systems but also to the rare groups of plants and animals which they support. This includes natterjack toads, a range of insects such as sand wasps, dragonflies,

and damselflies, and butterflies including graylings and dark green fritillarys (Gov.uk, 2008). Furthermore, a colony of little terns arrive in May and settle on beaches to breed (*ibid.*).

Additionally, the route is home to a much loved grey seal colony who come ashore a 5km stretch of beach at Horsey every winter to birth their pups. The colony appears to be growing since first inhabiting the beach in 2003, with latest count figures showing 1,643 pups born this season, an increase of 343 pups compared to the same week last season (BBC News, 2017a; Friends of Horsey Seals, 2017). Estimates suggest 50% of the world's grey seal population live and breed around the British coast, making sites such as this important for conservation (Norfolk Wildlife Trust, 2018), with grey seals being protected under the Conservation of Seals Act 1970 and the Conservation of Seals (England) Order 1999.

Finally, the route passes through the Broads National Park, protected due to its beautiful countryside, wildlife and cultural heritage (Gov.uk, 2018b). The Broads form Britain's largest protected wetland, home to more than a quarter of its rarest wildlife (Gov.uk, 2018c).

4.2 Intercept Contingent Valuation Survey Design

An intercept CV survey was conducted to elicit the recreational value of ECPS2. The survey was split into three sections, to obtain accurate and meaningful information firstly on respondent's use of the trail, secondly to elicit their WTP and reasons why, and finally to determine their socio-economic characteristics. (Bennett and Tranter, 1997; Bennett *et al.*, 2003; Oh and Hammitt, 2010). These sections were prefixed by an introductory script outlining the general context for the study, following the guidance of Carson (2000) and Jonhston *et al.* (2017).

A pilot study was conducted. This was used to identify any flaws within the survey or any questions that caused confusion, and more importantly, to determine how respondents reacted to the random WTP bid amounts. 30 respondents were intercepted along the trail for the purposes of this pilot study.

Five different bid amounts were selected following the pilot study. Equal numbers of surveys with these bid amounts were printed and given out in sequence, to ensure randomisation of the bid amount. The survey can be seen in Appendix 2.

Surveys were carried out over a period of three weeks in June and July, both during the week and over weekends. Users of the trail were intercepted, as this ensures respondents had a clear understanding of what was being valued (Bennet *et al.*, 1995; Bennet and Tranter, 1997).

Surveys were carried along three stretches of the trail, chosen to avoid 'tourist hotspots' such as Great Yarmouth. This ensured that respondents were recreational users of ECPS2, and not recreational beach and seaside visitors that happened to be on the trail. The three sections were along the trail near Winterton, Waxham and Horsey.

4.3 Travel Cost Design

Crucially, the intercept survey was designed such that the recreational value could also be calculated using the TC methodology. The survey asked for the postcode of respondent's home address, and for the respondent's annual income. Finally, respondents were asked for any car parking or other travel expenses.

4.4 Online Contingent Valuation Survey Design

An online survey was conducted to identify the existence, or the non-use, value of ECPS2 (Bennet *et al.*, 1995). This complements the intercept survey, which elicits the recreational, or the use, value. The two can be combined to calculate the total economic value (Loomis and Larson, 1994; Carson *et al.*, 2001; Richardson and Loomis, 2009).

This survey, mirroring the intercept survey, was split into three sections. The first asked respondents about their knowledge of the ECP and their use of the trail, the second asked respondents WTP followed by debriefing questions, and the third asked for respondents socio-economic characteristics. Again this survey was prefixed with a script outlining the context of the study, and can be seen in Appendix 3.

5. Results

5.1 Descriptive Results

159 intercept surveys were conducted. 80% of users stated they were either walking or dog walking, with other activities including running or nature appreciation (Figure 5). On average, users would visit the trail 28 times per year and walk 6km. However, 38% of users stated they were visiting the trail for the first time, so the average number of visits per year are likely to be skewed by local residents who will visit relatively frequently. 17% of users stated they visit the trail at least once a week. Users listed 'landscape,' 'peace and quiet,' 'fresh air' and 'wildlife' as qualities they value about the path, with very few listing more practical qualities such as 'car park,' 'accessibility' or 'way marking' (Figure 6). Hence the recreational value (estimated in Section 5.2) can be thought of as a function of these attributes.

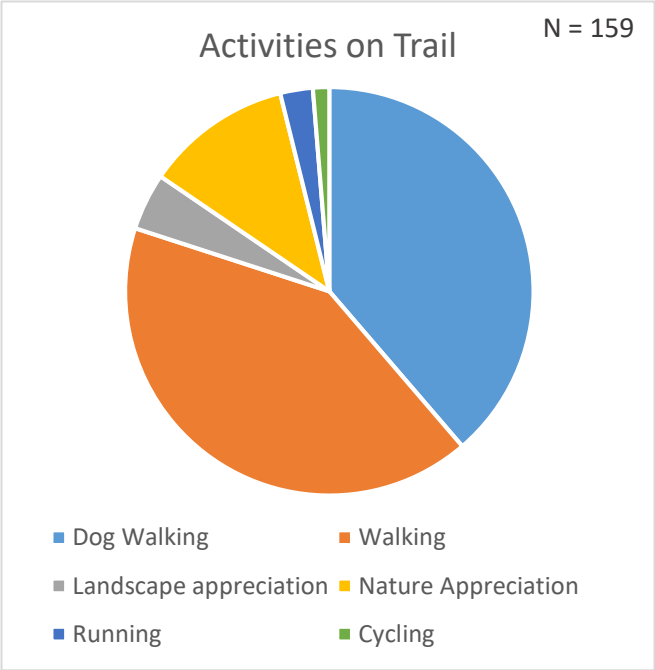

Figure 5: Activities undertaken by trail users.

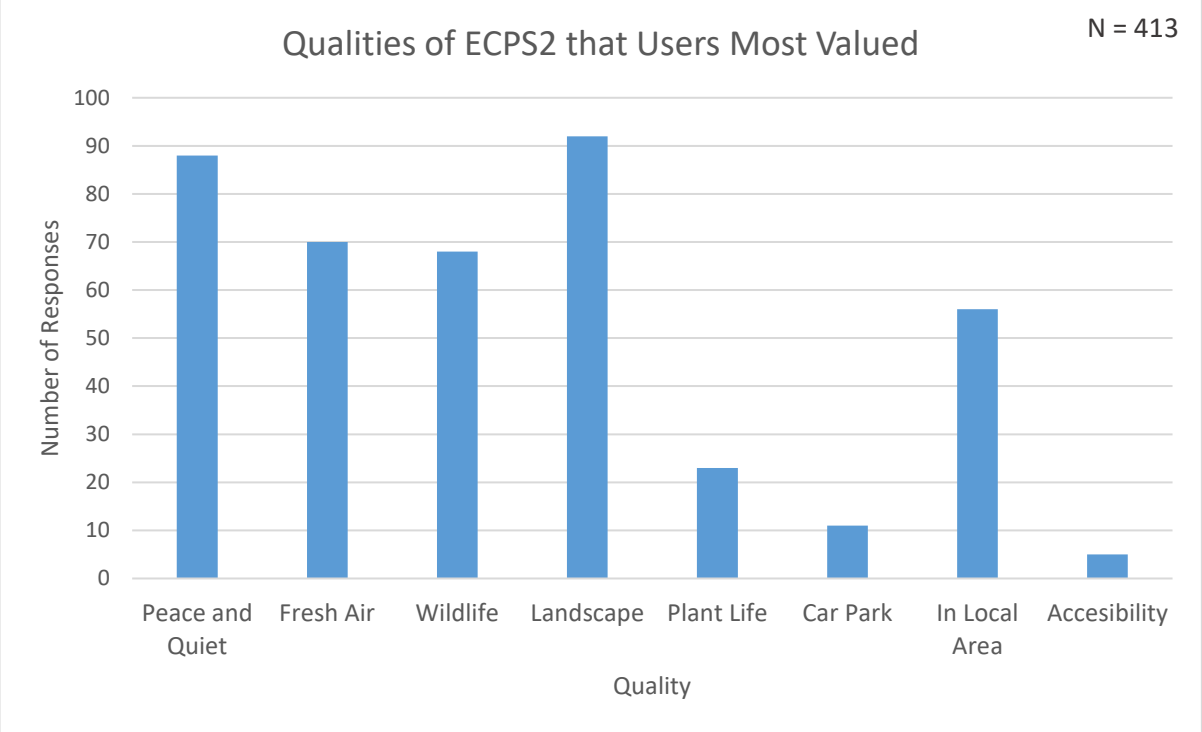

Figure 6: Survey responses to Q7 (Appendix 2); 'Which aspect of the path do you value the most?'

In terms of demographics, 48% of users were age 55 or older (Figure 7), and 34% were retired. 42% of users belonged to "green bodies" such as the National Trust. The majority of users (53%) identified their annual household income as £11,501 - £45,000, followed by the £45,001 - £150,000 bracket as the next most frequent (33%).

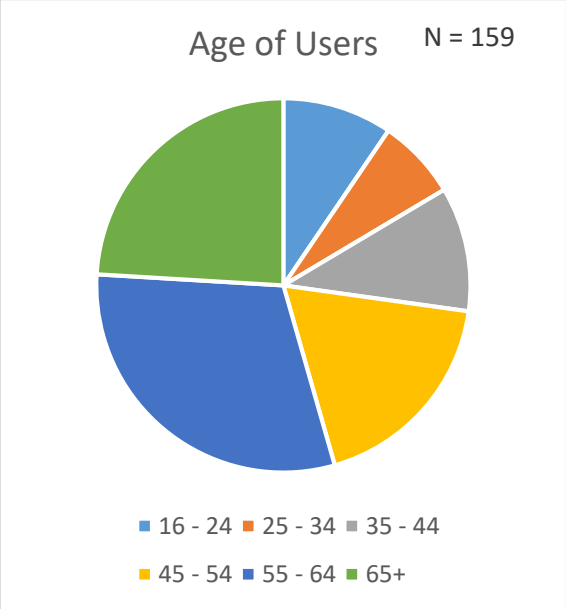

Figure 7: Age of ECPS2 users.

Results showed an average spend per person of **£20.90** (£20.27 - £38.12 95% confidence limits). This result does not include transport and car parking fees, as are accounted for in the travel cost analysis (Section 5.3). Regression analysis showed a statistically significant relationship between total spend and income ($P < 0.01$), belonging to a green body ($P = 0.04$), distance travelled to reach the site ($P < 0.01$) and distance walked along the trail ($P < 0.01$).

5.2 Contingent Valuation Results

Of the 159 surveys carried out, 52 were counted as 'protest votes' and excluded from CV analysis (see Section 6.4). Although a single-bound, dichotomous choice survey was administered, due to the natural tendency of users who did reject the bid amount to offer a value they would be more inclined to pay in the follow-up question, as well as the small sample size, the results were treated as double-bounded. Single-bound meaning one bid amount was asked, double-bound meaning two bid amounts were asked. Mean WTP, which has been widely accepted as relatively straightforward (Bennett *et al.*, 2003), was calculated as **£3.09** per person (£2.77 - £3.42 95% confidence limits).

The straightforward approach is suited to undergraduate dissertation level but also future implementation by NT, who may not have adequate environmental economics and statistical expertise to carry out more complicated analysis. Double-bound surveys have been shown to be statistically more efficient than single-bound (Hanemann *et al.* 1991; Kanninen 1993). This can mean fewer surveys are required, making analysis simpler.

Regression analysis showed a statistically significant relationship between age and WTP ($P < 0.01$), in that higher WTP values were elicited from younger respondents. No other statistically significant relationships were identified, which is to be expected of such a small sample size.

5.3 Travel Cost Results

It can be seen from Figure 8, showing the postcodes of respondent's home addresses, that some users travel considerable distances to reach ECPS2. This speaks for the value of ECPS2, hence use of the travel cost methodology becomes increasingly pertinent.

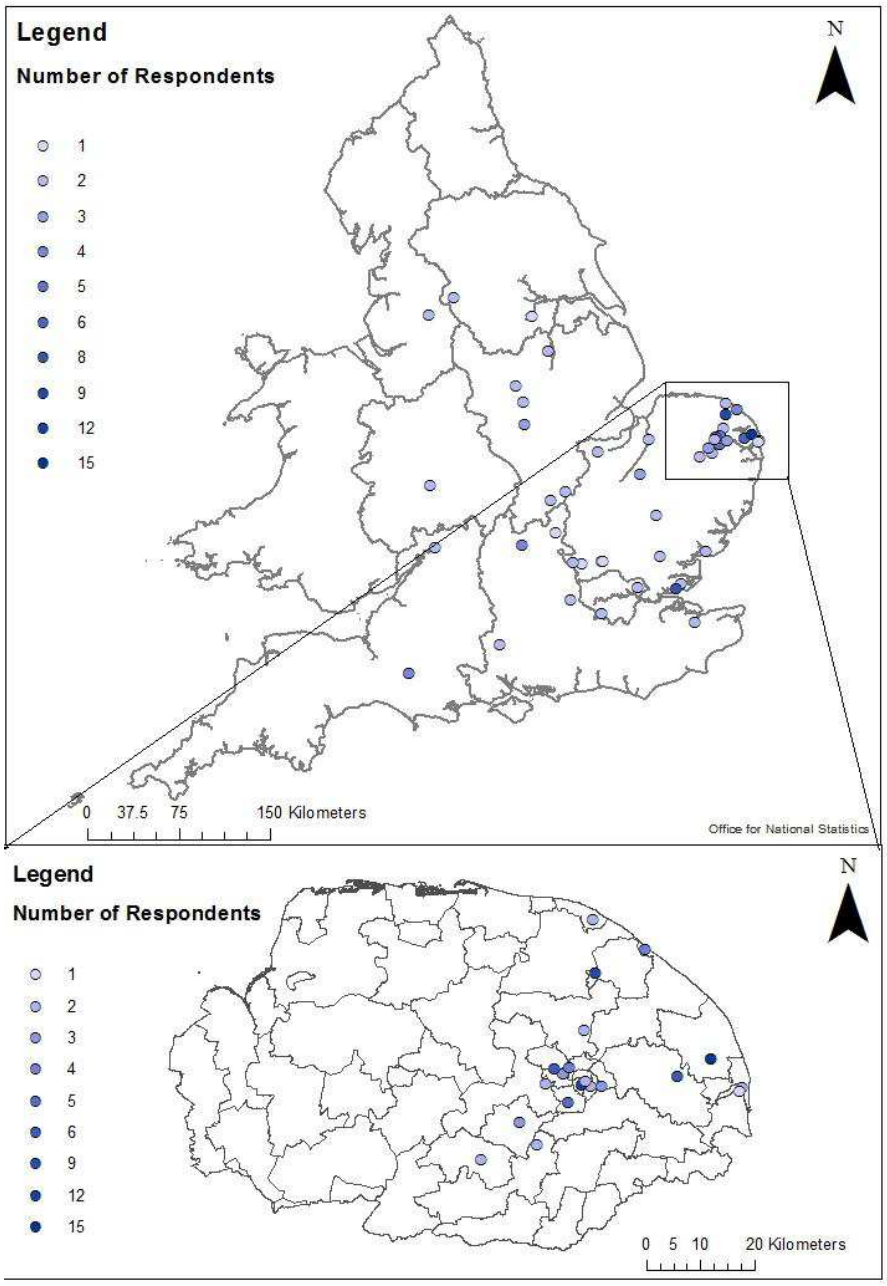

Figure 8: Locations of respondents home address, based on Q15 (Appendix 2).

The individual travel cost method (Willis and Garrod, 1991) was employed. This was based on the postcode of respondents home address (Q13, Appendix 2), which was fed into Google Maps to calculate the miles travelled to the site. As such fuel costs were calculated (Bertram and Larondelle, 2017), based on the standard UEA mileage rates (UEA Portal, 2017). The postcode of respondents home address was also used to calculate the time spent travelling, which was multiplied by three quarters of the residents wage rate (from Q15, Appendix 2), to account for the opportunity cost of time spent travelling (Parsons, 2013). Both of these factors were then doubled to account for the journey to the site and back home (Bertram and Larondele, 2017). Any car parking fees that respondents indicated they had paid were also included (Q11, Appendix 2).

Regression analysis was conducted comparing the number of visits against the travel cost, income, occupation, age, and whether or not respondents belonged to a green body. As the TC was shown to be statistically significant ($P < 0.01$) (Table 1), CS was calculated as:

$$CS = -1/TCC \quad (2)$$

where TCC is the travel cost coefficient (Bowker *et al.*, 2007; Shrestha *et al.*, 2007; Bertram and Larondelle, 2017). This study estimated a CS, or a recreational value, of £3.29 per visit.

Table 1: Output table for TC regression analysis.

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.47							
R Square	0.22							
Adjusted R Square	0.20							
Standard Error	64.06							
Observations	158.00							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5.00	180274.46	36054.89	8.79	0.00			
Residual	152.00	623737.08	4103.53					
Total	157.00	804011.54						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	87.37	28.84	3.03	0.00	30.40	144.35	30.40	144.35
Travel Cost	-0.30	0.06	-5.15	0.00	-0.42	-0.19	-0.42	-0.19
Household Income	0.00	0.00	-1.78	0.08	0.00	0.00	0.00	0.00
Green Body Membe	-14.08	10.82	-1.30	0.20	-35.44	7.29	-35.44	7.29
Retired	-26.91	13.97	-1.93	0.06	-54.50	0.69	-54.50	0.69
Age	0.18	0.41	0.44	0.66	-0.63	0.99	-0.63	0.99

5.4 Existence Value Results

82 existence value surveys were completed. In a similar way to the intercept CV survey (Section 5.2), mean WTP was estimated. An existence value of £2.29 (£1.60 - £2.98 95% confidence limits) was estimated.

5.5 Cost Benefit Analysis

Costs of constructing and installing ECPS2 route are outlined in Table 2. These costs include items such as bespoke timber signage (Figure 9), trail furniture, and staff time. Crucially, this table outlines NT costs of construction, hence does not outline any costs for marketing the trail, including professional photography, production of leaflets or social media marketing. Furthermore, the table does not include the costs to NE for their stages in outlining the route. As such the overall cost for the stretch is likely to be more, however this information was unavailable.

Figure 9: Example of bespoke timber signage (James Bensly, 2017).

As discussed in Section 3.2, valuation literature often ignores the economic impact of recreational spaces. However, when considering NT stated aims of ensuring nature contributes to Norfolk's economic success, for their trails to serve as a sustainable resources for the local economy, and to ensure business' benefit economically from their proximity to any trails (Norfolk Trails, 2017), the combination of economic impact and economic value becomes imperative.

Table 2: Costs to NT for construction and installation of ECPS2.

ECPS2 Construction Costs	
Item	**Cost (£)**
Bespokse Timber Signage	5,787.00
Waymark Stickers	370.00
Acorn Waymarkers	2,118.00
ECP Roundels	135.00
Interpretation "Dogs on Leads" Signs	208.00
Heritage Signpost	1,235.84
Interpretation - Alternate Route Signs	165.00
Town Signage Pointers	2,182.50
Street Furniture Installation	2,341.73
Additional Waymark Posts	350.00
Damage Repairs	32.00
Staff time	50,000.00
Mitigation	40,000.00
Total	**104,925.07**

The CV recreational value of £3.09 per person can therefore be combined with the average spend of £20.90 per person, to estimate a value of £23.99 per person. This can be multiplied by 115,509 annual users of ECPS2 to estimate an aggregate value of £2,771,060 annually. Similarly, the TC result can produce an estimate aggregate value of £2,794,162.

Cost-benefit ratios cannot be calculated due to the construction costs being a 'one-off' as opposed to annual maintenance fees or rental values. However, even when the lower estimate of the CV result is considered, the aggregate benefit of the trail outweighs the costs of construction nearly 26 times in its first year.

5.6 Interviews with Local Stakeholders

An interview was conducted with James Bensly, owner of the Hemsby Beach Café located along ECPS2, and a Borough Councillor for Great Yarmouth. He "could not speak highly enough of the trail," and felt it "put Hemsby on the map."

He argued more people are using ECPS2 now, compared to when much of the route existed previously as PROW. The National Trail brand was discussed and the reassurance it provides to walkers, and the trust that the public place in it. He argued that not only was he seeing more walkers as a result of the trail but that he was seeing walkers come back in the winter. This is significant to his business which has been, up until the launch, a seasonal "bucket and spade" beach café. He was now seeing more customers throughout the year. Additionally, he argued that people are now walking along the trail in groups, which is significant in combatting loneliness, depression and other mental health issues (see section 6.4).

Finally, he spoke about increasing interest in Great Yarmouth and the surrounding areas such as Hembsy. This includes a £10m investment into a local holiday park (Richardsonsholidaysparks.co.uk, 2017). He though that the trail "increased interest in the area," and that it may well have "worked hand in hand" to encourage this investment.

Although what can be gained from this interview is only anecdotal, it does add weight to the argument that the creation of ECPS2 has been beneficial to the region. Given greater time and resources, this is an example of how qualitative data could be used to support quantitative, and add richness to future studies.

6. Discussion

6.1 Comparison of Results

Table 3 shows a range of recreational value estimations from various studies. All values have been converted to GBP using Bank of England exchange rates (Bank of England, 2018), and adjusted for inflation using the Consumer Price Index, to 2016 prices (Office for National Statistics, 2018).

Table 3: Comparing the results of a number of recreation valuation studies.

Study Area	Valuation Methodology	Adjusted with CPI (£)	Author
Cannabullen Trail, Queensland	Benefit Transfer	£172.56	Cook, 2008
Derwent Country Park	Contingent Valuation	£0.68	Bishop, 1992
Whippendell Wood	Contingent Valuation	£0.87	Bishop, 1992
Windsor Forest	Contingent Valuation	£1.59	Bennett and Tranter, 1997
South Carolina State Park	Contingent Valuation	£0.82	Oh and Hammit, 2010
Windsor Forest	Contingent Valuation	£1.66	Bennett, 1995
Rideway National Trail	Contingent Valuation	£1.65	Bennett *et al.* , 2003
Tupuri Forest, Finland	Contingent Valuation	£2.35	Tyrvainen, 2001
Maalu Forest, Finland	Contingent Valuation	£2.47	Tyrvainen, 2001
Kankare Forest, Finland	Contingent Valuation	£1.52	Tyrvainen, 2001
Agricultural Land, Israel	Contingent Valuation	£34.27	Fleischer and Tsur, 2009
Urban Greenspace in Guangzhou, China	Contingent Valuation	£1.40	Jim and Chen, 2006.
Apalachicola River region, Florida	Count-data Travel Cost	£45.20	Shrestha et al., 2007
Hula Valley	Count-data Travel Cost	£162.38	Fleischer and Tsur, 2000
Jazreel Valley	Count-data Travel Cost	£47.65	Fleischer and Tsur, 2000
Grunewald Forest	Individual Travel Cost	£12.73	Bertram and Larondelle, 2017
Brecon Forest	Individual Travel Cost	£2.35	Willis and Garrod, 1991
Buchan Forest	Individual Travel Cost	£0.84	Willis and Garrod, 1991
Cheshire Forest	Individual Travel Cost	£0.67	Willis and Garrod, 1991
Lorne Forest	Individual Travel Cost	£2.57	Willis and Garrod, 1991
New Forest	Individual Travel Cost	£3.89	Willis and Garrod, 1991
Ruthin Forest	Individual Travel Cost	£2.17	Willis and Garrod, 1991
Thorsborne Trail, Queensland	Zonal Travel Cost	£112.73	Cook, 2008
Sonoran Desert, East	Zonal Travel Cost	£15.26 - £23.23	Weber and Berrens, 2006
Sonoran Desert, West	Zonal Travel Cost	£10.79 - £14.64	Weber and Berrens, 2006
Xiamen Island, China	Zonal Travel Cost	£11.99	Chen *et al.* , 2004

It can be seen from Table 3 that previous attempts at valuing nature have produced a vast array of results. This does, of course, depend on the site being valued, but also on the methodology. Willis and Garrod (1991) have shown that differences in zonal travel cost

(ZTCM) and individual travel cost (ITCM) estimations of consumer surplus exist, as well as differences between CV and TC estimations (see Table 4). Brander and Koeste (2011) show further the fundamental differences between CV and hedonic models, and how this yields different results. Despite these factors, the recreational value estimations made in this thesis seem very much in line with the results shown in Table 3.

Table 4: A comparison of some benefit estimates for informal forest recreation (Willis and Garrod, 1991).

	Consumer Surplus Based on ZTCM (OLS) (£)	Consumer Surplus Based on ITCM (OLS) (£)	Willingness to Pay (CV) (£)
Brecon	2.6	0.66	0.46
Buchan	2.26	0.20	0.57
Cheshire	1.91	0.06	0.47
Lorne	1.44	0.96	0.72
New Forest	1.43	0.12	0.43
Ruthin	2.52	0.88	0.44
(per person per visit, 1988 prices)			

NT currently estimate the value of their trail as £18 per visit (personal communications, 2017), based on the MENE report (Natural England, 2016). However use of this value is inaccurate for a number of reasons. Firstly, MENE only looks at the average spend per visit, hence does not look at the recreational value. Secondly, it looks at visits to the coast and not coastal paths, which is important as the two will attract different users who will undertake different activities, and as such will value the areas differently. It is encouraging to see the results from this study are higher than those of the MENE report, meaning that NT have been underestimating the value of their trail.

6.2 Existence Value Discussion

Some previous research has extrapolated existence values (Turpie, 2003). In this case, the value could be extrapolated to the Norfolk population of 892,870 (Office for National Statistics, 2017) to estimate an existence value of £2,044,672. Other research, in a more conservative estimate approach, assumed that respondents who refused to answer have a WTP of zero, and as such accounted for the response rate in their estimations (Loomis *et al.*, 2000). The survey platform used in this study makes it difficult to ascertain a response rate.

Pearce and Turner (1990) describe a total user value which combines use and non-use values per user. As such, the intercept CV value of £3.09 can be combined with the online CV value of £2.29 to estimate a total user value of £5.38. This can be multiplied by annual users of ECPS2 to estimate an aggregate total user value of £621,438, and again combined with the user spend to suggest a final aggregate value of £3,035,568.

Some researchers discuss the idea of total economic value as a combination of use and non-use values (Loomis and Larson, 1994; Carson *et al.*, 2000; Richardson and Loomis, 2009). As such, the existence value, extrapolated to the Norfolk population, could be combined with the aggregate recreational value of £356,922 to estimate a total economic value of £2,401,594.

Due to significant debate in the literature surrounding existence values (Rosenthal and Nelson, 1992; Turner *et al.*, 2003), and because of the relatively small sample size as well as some sample biases (Section 6.3.3), it is difficult to determine how best to analyse the existence value results. The existence value results presented in this thesis should only be taken at face value. However, with greater time and resources a more reliable existence value study could be undertaken, which would allow for better analysis of the results. As such, it is still an important concept to introduce and include in this thesis, to inform NT of some of the ways in which the concept can be analysed and manipulated, and to advise that it should be included in future research.

6.3 Limitations

With greater time and resources, this study could be improved in a number of ways that may increase the validity and reliability of the results. However, this is not to discredit the results, conclusions and learnings that can be drawn from this thesis, which has begun extensive research into the area for NT and can serve as a thorough pilot study. Furthermore, this thesis provides another non-market valuation estimate that can be used in research by academics or consultants, contributing to the body of grey literature on the topic.

6.3.1 People Counters

Figure 10: People counter post along ECPS2 (Norfolk Trails, 2017).

NT have experienced a number of issues with their people counting, and in particular with the people counters along ECPS2 (Figure 10). The counts used in this thesis are an estimate based on average counts over the year. Hence the total economic value suggested based on the people count may be inaccurate. Some of these issues involve the people counter simply going offline, problems with vandalism, or with extensive vegetation growth distorting final counts (personal communications, 2017). Some of these issues however, can be thought of as 'teething problems' that will likely improve over time as the counter is able to establish more accurate averages.

6.3.2 Surveying Methodology

Time and resource constraints were such that the intercept survey could only be conducted over a three week period in the summer. The landscape and the trail naturally changes throughout the year with the seasons, and as such users may value different attributes of the trail at different times of the year, and this will likely reflect in WTP elicitations. As such, it would be an improvement in future studies to survey throughout the year.

6.3.3 Online Survey

The sample of the online CV survey has two notable biases. Firstly, the survey was shared amongst the staff at the School of Environmental Science at the University of East Anglia. These staff may share similar demographic characteristics or hold similar values, which will reflect in their WTP elicitations. This may lead to biased results. Secondly, the survey was shared across social media platforms, which may result in biases based on who the survey reached.

6.3.4 Travel Cost Limitations

A number of assumptions were made when calculating the TC that may impact the validity of the results. Firstly, the survey asked for household income whereas TC must be estimated using individual income. As such household income was divided by the average number of people in UK households, which may produce inaccurate results. This can be easily improved in future surveys carried out by NT. Secondly, where respondents stated household income up to £11,500, an annual income of £8,000 was assumed, based on the minimum wage. Finally, it was assumed respondents worked 2080 hours annually, which was used to calculate a wage rate as a proxy for time costs. This may lead to inaccurate results with, for example, part-time workers. However, this assumption is frequently made in the applied literature (Parsons, 2013; Bertram and Larondelle, 2017).

Worth more consideration is that this study did not include the TC to potential substitute sites in the regression analysis. This is normally carried out based on the second assumption discussed in Section 3.5.2. As such, CS of ECPS2 users may have been undervalued (Bertram and Larondelle, 2017).

Finally, no adjustments were made for cases where two or more people travelled to the site in the same vehicle. In any future research, it would be good practice to divide transportation costs by number of people in the party (Fleming and Cook, 2008). A question asking for number of people in party could be very easily included in future studies.

6.3.5 Cost-Benefit Analysis Limitations

The CBA has not considered the opportunity cost of other projects that could have been funded with the resources used to finance ECPS2. It would be best practice to include this in future CBA.

6.4 Protest Votes

Protest votes, or protest bidding, is where refusal to pay the stated user fee does not appear to reflect the respondent's true valuation of the recreational access (Teasley *et al.*, 1994). In this survey these often manifested as answers such as "already pay council tax," "have already paid for the carpark," and "countryside access should be free." These answers do not imply that the user does not value being able to access the footpath, and often quite the opposite. It merely suggests that the respondents are objected to these types of questions,

or the idea of having to pay. It is common practice to discard these protest votes from WTP estimations (Cummings *et al.*, 1986; Boyle and Bishop, 1988; Reiling *et al.*, 1989; Oh and Hammitt, 2010). In this study, 62 of the 159 surveys (38%) were discarded. Compared to other studies who have received 9.7% protest votes (Bennett *et al.*, 2003), 18% (Oh and Hammitt, 2010), or 22% (Bennett, 1995), the question as to why this survey received so many protest responses follows.

23% of protest vote respondents stated that they would avoid paying and walk along other coastal trails, or would walk beside ECPS2 either along the beach or the dunes instead. It would seem, contrary to the advice of Johnston *et al.* (2017), the utility consequence of not being able to access the path was not clear, or in other words, there were viable alternatives for respondents such that they could refuse to pay. It is likely this is a particular problem of coastal CV studies because beaches or clifftops will often exist as an alternative to coastal paths. This substitute may not be as readily available with countryside or forest valuations where land outside of the route is privately owned.

A further 19% of protest votes were attributed to already paying for the carpark. In a subsequent interview with the Senior Trails Officer at NT, the "juxtaposition between people so willing to pay for the likes of Intu carparks, a large corporation, compared to people so unwilling to pay for carparks that are privately owned" was discussed. Anecdotally, a number of people were surprised to find out that the carparks near survey sites were privately owned and not owned by Norfolk County Council, which may explain why respondents were unwilling to pay further money towards the County Council. Questions surrounding what people feel should be or expect to be provided by local authorities and what they assume is provided are raised, in contrast with what is actually provided.

Previous studies have linked protest voting with public sensitivities surrounding council tax (Bennett *et al.*, 1995). With 16% of users answering that they "already pay for the trail through tax," it is possible these sensitivities may have arisen in this study also. These may stem from issues such as the "Age of Austerity," (BBC News, 2017b), the public sector cap (BBC News, 2017c), or the increasing pressures faced by the NHS (BBC News, 2018a; BBC News, 2018b; BBC News, 2018c).

Regression analysis showed a statistically significant relationship between protest voting and number of visits ($P < 0.01$), in that those who visit more frequently were more likely to protest vote. This could be because, as a number of respondents answered, they use the route too frequently to pay an entrance fee each visit, as the cost would begin to add up. Again, 17% of respondents stated they used the route at least once a week (Section 5.1) so it is likely those users who are unwilling to pay. Often, users stated they would have preferred an annual fee or a donation box, which may have appeased some of these concerns. It would be interesting to provide this payment vehicle in future studies.

Furthermore, much of the route existed as PROW before the launch, with only 5km of new coastal access being created (Gov.uk, 2016b). Respondents, and particularly regular users of ECPS2, may feel unwilling to pay for something they feel already existed and has simply been 'rebranded' as ECP.

6.5 Other Economic Value

In looking at estimates of recreational value and economic impact, one very significant aspect of the economic benefit of ECPS2 is overlooked; the economic benefit of physical activity. This idea is particularly pertinent as one of NT stated aims is to "improve people's health, mental health and well-being by connecting communities with nature," (Norfolk Trails, 2017).

Conservative estimates suggest that physical inactivity costs the NHS between £1bn and £1.8bn annually, a figure which could be doubled if conditions such as falls or osteoporosis are included (Department for Health, 2009). Physical activity leads to a wealth of benefits to health, including reduced risks of coronary heart disease, obesity, hypertension, certain cancers, and osteoporosis (*ibid.*). To quantify, those who are physically active reduce the risk of developing stroke and type 2 diabetes by up to 50% and the risk of premature death by 20-30% (*ibid.)*.

Recreational walking is known to produce mental health and well-being benefits also, resulting from an appreciation of landscape, wildlife, and weather, combined with the rewards from a sense of exploration within the landscape. Hence, walking along coastal trails with the added value of the activity being embedded in the landscape, has been linked

to improving self-esteem and relieving symptoms of depression and anxiety (Blumenthal *et al.*, 1999; Department for Health, 2009).

Furthermore, walking is considered a universally accessible and acceptable form of physical activity (Wimbush *et al.*, 1998). The health benefits that walking provides therefore become increasingly important in reference to recreational trails as they are accessible to almost everyone. Furthermore, those most at risk of leading sedentary lifestyles include older people, who experience a notable decline in physical activity after the age of 55 (Department for Health, 2009). This is particularly pertinent as this study showed 48% of users of ECPS2 were aged 55 or older (Section 5.1). As such this trial provides a means for physical activity, and in particular to a high risk group, which should be reflected in CBA.

The idea of health and well-being values is gaining interest in the academic world and becoming increasingly researched. Bodies have been set up to provide funding for this research, such as the five year, £6.5m Valuing Nature Programme, funding research to improve the understanding of the role of biodiversity and ecosystem processes in human health and well-being (valuing-nature.net, 2017a). This programme also recognises the value of coastal access specifically, with another project, CoastWEB, looking at valuing the contribution coastal habitats make to human health and well-being (valuing-nature, 2017b).

The Health Economic Assessment Tool (HEAT) for cycling and walking, is a tool created by the World Health Organisation to estimate the value of reduced mortality that results from regular walking and cycling (World Health Organisation, 2014). It is designed specifically to facilitate evidence-based decision-making, for example to be part of comprehensive CBA of transport or infrastructure projects such as the ECP (*ibid.*). This is a tool that could be used to estimate the health value of walking that ECPS2 enables, which could feed in to future CBA.

7. Conclusion and Further Research

This thesis has looked at the concept of valuing nature, and more specifically, the non-market valuation techniques that can be used to assess the economic value of public goods in the absence of market prices. Two methodologies, the travel cost and the contingent valuation, were then applied to NT newest stretch of coastal access, to identify its recreational value. Results of the valuation were then fed into a CBA to determine whether construction of the route was worthwhile economically. This thesis coincides with the ECP scheme, making the results particularly pertinent as they could feed into the planning of subsequent phases of the ECP. The CV and TC estimated recreational values of £3.09 and £3.29 per visit respectively. These values were combined with an average user spend of £20.90, and shown to outweigh the costs of construction even in the first year. This thesis will be shared with NT, such that they can use the recreational values and the results from the CBA to support decision-making and funding applications. Furthermore the methodologies outlined, and the learnings from employment of the methodologies, will provide a framework to NT for future valuation studies of their trails.

The first conclusion to be drawn is of the disconnect between the academic world of recreation valuation, and application by those who manage recreational spaces. Where the literature talks overwhelmingly about non-market valuation, this is not reflected in practice. As such those managing recreational trails, such as NT but also with a wider application, are undervaluing their recreational areas. They must begin to incorporate non-market valuation to more accurately estimate the economic value of their trails and not just the economic impact their recreational spaces create. Although academics often work in interdisciplinary teams, perhaps they should begin to collaborate with bodies such as NE that are working on the ground. From the perspective of NT, it can be concluded that the public do identify a value for simply being able to access ECPS2 and use it for recreation, and as such they must begin to assess this recreational value.

The second conclusion to be drawn is of those who are likely to spend more along ECPS2. As discussed in Section 5.1, those who are younger, with greater income, members of green bodies, those who have travelled from further to reach ECPS2, and who aim to walk further along ECPS2 are likely to spend more money associated with their visit. NT could therefore implement a number of strategies to encourage use of the trails by these groups to increase

the economic impact of ECPS2. For example, creation of a geocaching trail may encourage users to walk further along ECPS2, or NT could aim to work collaboratively with the likes of the National Trust to encourage their members to explore the trail.

Finally, based on the high protest vote rate the CV questionnaire received, likely stemming from some of the route previously existing, the existence of viable substitutes, public confusion about what is provided by local authorities, and more generally a longstanding history of public footpath provision in the UK, the third conclusion to be drawn is the importance of employing more than one non-market valuation methodology. Literature exists on not only the combination of RP and SP methodologies (Adamowicz *et al.*, 1994) but on specifically combining CV and TC and what can be gained (Cameron, 1992; Englin and Cameron, 1996; Kling, 1997; Alberini and Longo, 2006). This literature could be used as the starting point for the next stage of research; identifying an appropriate way to combine the results from the two methods, and then applying these methods to begin to estimate the recreational value of the NT.

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10. Appendix

Appendix 1: Norfolk County Councils Self-Registration Surveys

SS1 - Weybourne Norfolk Trails User Survey

We are carrying out a survey of Norfolk Trails users to better understand your requirements and how we can improve our services - please help us by completing this form. The information you give will be CONFIDENTIAL. Please complete only ONE form for each GROUP and put it into the box provided. Complete the form by putting a [√] tick in the relevant boxes.

1. Please record today's day and month:

Mon [ ] Tue [ ] Wed [ ] Thu [ ] Fri [ ] Sat [ ] Sun [ ]

Jan [ ] Feb [ ] Mar [ ] Apr [ ] May [ ] Jun [ ]

Jul [ ] Aug [ ] Sep [ ] Oct [ ] Nov [ ] Dec [ ]

2. How many people are in your party? (including yourself) *Please write in number*

Male	----------	Female
	Under 18	
	18-35	
	36-60	
	Over 60	

3. Are you:

Walking [ ]
Dog Walking [ ]
Cycling [ ]
Other (please specify) _____

4. How many times will you pass this point today?

Once [ ] Twice [ ] More [ ]

5. Which ONE of the following BEST describes your visit to this Trail?

Please select one answer only

I am:
on a SHORT visit (less than 1 hour) [ ]
on a PART-day visit (1-4 hours) [ ]
on a FULL-day visit (5 or more hours) [ ]
on a long distance trip (more than 1 day) [ ]

6. Is this your first visit to this Trail?

YES [ ] NO [ ]

If NO, approximately how often do you visit this Trail during the year?

Daily	[ ]	8-11 times a year	[ ]
4-5 times a week	[ ]	5-7 times a year	[ ]
2-3 times a week	[ ]	2-4 times a year	[ ]
Weekly	[ ]	Once a year	[ ]
Once a fortnight	[ ]	Less often	[ ]
Once a month	[ ]	Don't know/not sure	[ ]

7. Did you / will you use public transport as part of your walk or to get to or from this Trail? YES [ ] NO [ ]

8. Did you use a website to find out information about the route before your visit to this Trail? YES [ ] NO [ ]

If YES, which one(s)

.....

9. What is the postcode of your permanent address? If you are from overseas, which country are you from?

(This is just to help us monitor where visitors come from)

.....

10. During your visit to this Trail, approximately how much have you spent on the following, per person, per day and where?

Please write in £

Accommodation [£]

Where:.....

Food and drink [£]

Where:.....

Other activities [£]

What / where:.....

11. To what extent have you enjoyed using this Trail, on a scale of 1 to 5?

Not at all 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5 [ ] Very much

12. Will you:

Return to this Trail? YES [ ] NO [ ]
Recommend this Trail? YES [ ] NO [ ]

13. Please include your e-mail address if you would be happy to complete a more detailed survey? *(Not everyone will be sent an additional survey)*

.....

Thank you for your help. Please post this completed form through the slot in the box.
Alternatively please fill in directly on-line at:
www.smartsurvey.com/s/NationalTrailUser
Please only complete this form/survey once even if you use the trail again.

Appendix 2: Contingent Valuation Survey

NATIONAL TRAIL Norfolk County Council NORFOLK TRAILS

New legislation established in 2009 has meant that a route around the entire English coast is to be established where the public are enabled to make recreational journeys. As part of this in October 2016, 21 miles of coastal access from Sea Palling to Hopton-on-Sea was launched.

Section 1:

1) Have you read, understood and agree to the confidentially and consent statement?
Yes [ ] No [ ]

2) Were you aware of the England Coast Path scheme?
Yes [ ] No [ ]

3) Were you aware that you were on a new stretch of England Coast Path? Yes [ ] No [ ]

2) Since this stretch was launched in October 2016, how many times have you used the path?

……

3) Did you use this route, or any of the rights of way associated with this route, before it was launched in October 2016?
Yes [ ] No [ ]

4) If yes, please state how many times you would use the route in a 12 month period?

……

5) Are you
Walking [ ] Dog Walking [ ] nature appreciation [ ]
Running [ ] Cycling [ ] landscape appreciation [ ]
sightseeing [ ] Other (please specify)

……

6) How far along this path are you planning to go today
(answer can be given as distance or from place to place)

……

7) Which aspects of the path do you value the most?
(please tick 2 or 3 most important)
Fresh air [ ] Peace and quiet [ ] Landscape [ ]
plant life [ ] wildlife [ ] Accessibility [ ]
car park [ ] proximity to public transport [ ]

other (please specify) ……

Section 2:

Please imagine a **hypothetical** scenario whereby an entrance fee onto this stretch of Norfolk Coast Path (from Sea Palling to Hopton-on-Sea) was charged by Norfolk County Council to fund the necessary maintenance and upkeep of the trail, to maximise user enjoyment.

8) Would you be willing to pay an entrance fee of (£2, 3, 4, 7, 10) to access this trail for a day?
Yes [ ] No [ ]

9) Please explain your answer to the previous question?

……

……

10) Would this entrance fee cause your use of the Coast Path to change? If so how?

……

Section 3:

11) How much do you expect that you will spend in total today in the local area on the following:
Eating and drinking in cafes, pubs, restaurants

……

Buying food and snacks from shops

……

Shopping such a souvenirs

……

Tourist and recreational activities (for example water sports lessons)

……

Transport, petrol and car parking

……

Other (please specify)

……

12) Please tick which age bracket you fall into?
16-24 [ ] 25 – 34 [ ] 35 – 44 [ ]
45 – 54 [ ] 55 – 64 [ ] 65 + [ ]

13) Please give the postcode of your home address

……

14) Please state your occupation?

……

15) Which annual gross income bracket does your household fall into?
Up to £11,500 [ ] £11,501 - £45,000 [ ]
£45,001 to £150,000 [ ] over £150,000 [ ]

15) Do you belong to any countryside or green bodies, e.g. National Trust?
Yes [ ] No [ ]

Thank you on behalf of Norfolk Trails for taking the time to fill out this survey

Appendix 3: Online Survey

Copy of Dissertation non-intercept survey

I am a BSc Geography undergraduate at UEA carrying out this research as part of my final year independent project. This research will feed back to Norfolk County Council, with whom I completed my year in industry, to provide an estimation of the economic value of one of their walking trails.

New legislation established in 2009 has meant that a route around the entire English coast is to be established where the public are enabled to make recreational journeys. As part of this in October 2016, 21 miles of coastal access from Sea Palling to Hopton-on-Sea was launched. This section of coast path is renowned for its striking dunescape, its stunning landmarks including the Happisburgh Lighthouse, and the much loved grey seal colony who come ashore every winter to breed. Furthermore sections of the route are of significant scientific and ecological importance, with the Horsey-Winterton SSSI home to dragonflies, rare butterflies, the natterjack toad and a little tern colony.

Confidentiality and Consent

Please note that you can refuse to answer any question you wish. All data will be collected anonymously. All personal information will be used only for the purposes of this study and will then be destroyed. Although the results of the survey will be shared with Norfolk County Council, personal information will not be shared. This research has received ethics clearance from UEA.

1. Have you read, understood and agree to the confidentiality and consent statement above?

- ◯ Yes
- ◯ No

2. Were you aware of the England Coast Path scheme prior to reading the statement above?

- ◯ Yes
- ◯ No

3. Have you ever, or do you intend to walk along this section of Norfolk Coast Path?

- ◯ Yes
- ◯ No

Copy of Dissertation non-intercept survey

Please imagine a **hypothetical** scenario whereby an entrance fee onto this stretch of Norfolk Coast Path (from Sea Palling to Hopton-on-Sea) was charged by Norfolk County Council to fund the necessary maintenance and upkeep of the trail, to maximise user enjoyment.

4. Would you be willing to pay an entrance fee of : £2/3/4/7/10 to access the trail for a day?

- ◯ Yes
- ◯ No

5. Please explain your answer to the previous question

Prev Next

Copy of Dissertation non-intercept survey

6. Please select which age bracket you fall into

- ◯ 16 - 24
- ◯ 25 - 34
- ◯ 35 - 44
- ◯ 45 - 54
- ◯ 55 - 64
- ◯ 65+

7. Please state your occupation

8. Which annual gross income bracket does your household fall into?

- ◯ Up to £11,500
- ◯ £11,5001 - £45,000
- ◯ £45,001 - £150,000
- ◯ Over £150,000

9. Do you belong to any green or countryside bodies (such as the National Trust)?

- ◯ Yes
- ◯ No

Prev Done