

Natural England Joint Publication JP018

A trial of self-closing bridlegates: 2015

Undertaken by Natural England in partnership with the British
Horse Society

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**A TRIAL OF SELF CLOSING BRIDLEGATES: 2015
UNDERTAKEN BY NATURAL ENGLAND IN PARTNERSHIP WITH
THE BRITISH HORSE SOCIETY**



The
British
Horse
Society

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Abbreviations

ADEPT	Association of Directors Environment, Economy, Planning and Transport
BHS	British Horse Society
BS	British Standards
CLA	Country Landowners Association
IPROW	The Institute of Public Rights of Way and Access Management
LAF	Local Access Forum
NFU	National Farmers Union
HLS	Higher Level Stewardship

1.0 Summary

This report records the evidence collected in a trial of self-closing bridlegates that took place in September 2015. The aim of the trial was to identify the criteria that contributed to safe use and ease of use of gates whilst retaining key features, namely stock proofness and robustness. The analysis of the data is examined in the report and the discussion and conclusion present a number of key recommendations. The audience for the report is expected to be wide ranging, including bodies representing landowners and land managers, regulatory bodies, the manufacturers of gates and user groups.

Landowners have increasingly installed self-closing bridle gates in preference to non-self-closing bridle gates; this is in order to reduce the possibility of gates being left open and stock escaping. However the British Horse Society (BHS) became aware of incidents with self-closing gates where horses or riders were injured. The BHS ran a trial of existing self-closing bridle gates in 2011. The trial confirmed that there were problems with self-closing gates when used by horse riders. The published report made a number of recommendations including that a further trial be conducted.

The 2015 trial held at Askham Bryan College was overseen by a working group including Natural England and representatives from landowning and user groups and the British Standard Committee. The trial did not aim to find one gate that was 'best' but rather it looked for the elements of the gate that contributed to safe use, ease of use, stock proofness and to a lesser extent robustness by investigating ten gates with different design features. A range of participants were invited to take part in the trial, these included horse riders, walkers, cyclists, mobility scooter and wheelchair users, the visually impaired and farmers. Information was gathered using questionnaires and the passage of each of the participants passing through the gates was recorded by video. The evidence was then analysed against a set of hypothesis tailored to each user group. In addition, the gates were tested with stock to establish that they were stock-proof; this is the first time that bridlegates have been tested in this way.

The evidence showed that adult, able-bodied walkers and cyclists were able to use all the gates, safely and easily. Difficulties were encountered by horse riders and those using mobility scooters or wheelchairs; in the case of these two groups it was seen that non-self-closing gates were safer than self-closing gates with ease of use and safe use being closely associated. For the farmers in the trial the overriding desirable feature was that the gates were stock proof when closed. Whilst we agree that stock proof handles may often be necessary where cattle are present we recommend that further development of stock proof handles should be undertaken to improve the usability for horse riders and the disabled in particular.

The criteria enabling safe and easy passage of the self-closing gates by horse riders and mobility scooter and wheelchair users was found to be the following:

- 2 way opening
- Force required to open the gate of no more than 18 Newtons (and preferably less)

- Closing time of 8 seconds
- Gate closing to be dampened, so that the gate remains open near its maximum opening point for 1-2 seconds before closing, rather than bounce back on its hinges, even after being flung open.
- A handle angled towards the slam post
- Manoeuvring space clear of obstacles

Additionally to enhance ease and safer use:

- Clear width of opening of 1.7metres
- A handle that facilitates control by horse riders as demonstrated by the ring handle
- A D shaped latching mechanism

The trial also indicated that the BHS recommended approach of “heels to hinges”² is easier and probably safer, and if the findings of the trial regarding the usefulness of the training video are confirmed by further investigation, the training video could be included in general riding training.

The trial found that there were many elements of gate design that could be improved to make it easier for people with a range of disabilities to use gates, this included:

- Improving signage;
- Improving coloured indicators on parts of the gate that could be used to open the gate;
- Adding push plates at the right height for mobility scooter and wheelchair users; and,
- Improving latch design for people with reduced manual dexterity.

In addition mobility scooter and wheelchair users may benefit from some further research into the use of the best positioning of their chair or scooter to reduce how much they may need to stretch to reach handles or latches, plus the development of an aid that can be used to open latches.

We, the working group, conclude that:

- the BS committee should review these finding and incorporate some of the factors into a revised BS 5709
- gate manufacturers should be able to use the findings from this research to produce better gates

² For illustration please refer to Photographs 1 and 2 on pages 50 - 51

- landowners and highway authorities can act in the short term to improve safety by providing clear manoeuvring space for the “heels to hinges” approach whenever possible and tying back gates when not in use.

2.0 Background

Gates have been installed on bridleways for many years for the purpose of controlling livestock and allowing the passage of horse riders and other users such as cyclists, walkers, and those in mobility scooters and wheelchairs³ as well as people with pushchairs. Many gates in use are typical field gates, not designed specifically for use on a public right of way to provide public access: these gates are not the subject of this research. In recent years smaller, self-closing, bridle gates have become increasingly popular with landowners to avoid the possibility of gates being left open. Government bodies, local authorities and non-government organisations have also been using self-closing bridle gates on areas of land that have been fenced to facilitate management by grazing. This has included sites managed by Natural England and sites funded under the Higher Level Stewardship Scheme.

The latest version of British Standard BS 5709 Gaps Gates and Stiles was issued in 2006. The Standard is a functional one: those who install gates are clearly directed to use the 'least restrictive option'. The purpose of the standard is to describe the performance standards that should be met by a structure rather than give specifications for materials, but it provides some guidance on the physical structures that can be installed. The standard was last revised in 2006 and at this time self-closing gates were not commonly installed; for this reason the standard did not specifically address issues pertaining to self-closing gates. Since 2006 the BHS became aware of a number of reports of accidents and near misses with these newly installed self-closing bridle gates (see photograph at Appendix 1). The result has been physical injuries to horses and riders and fear of using such gates which affects the ability of horse riders to access areas of the countryside.

In order to address this issue in 2011 the BHS trialled six self-closing gates to assess their reliability and ease of use. The results of the trial were published in '*A trial of self-closing bridle gates and a horse-friendly vehicle barrier*' by The British Horse Society 2011. In brief, within the study no gate was identified which fitted all of the criteria of the trial; the Worcester hydraulic one-way gate made by Centrewire was the best of the gates trialled. A number of recommendations were made in the report to carry out further research and development work (see Appendix 2).

Natural England's purpose includes 'securing the provision and improvement of facilities for the ... enjoyment of the natural environment, and promoting access to the countryside and open spaces and encouraging open-air recreation'. Since many self-closing gates were funded by the Higher Level Stewardship (HLS) Scheme it was considered appropriate that Natural England should support the BHS to follow up the 2011 trial with further investigations and a further trial of greater depth and scope. For such a trial to be successful

³ A **mobility scooter** is a mobility aid that is electrically powered and configured like a scooter. A **wheelchair** is a chair with wheels which can either be electrically powered or manually powered. **mountain trikes** are a type of manually powered wheelchair which are especially built for use on tracks, similarly, a **tramper** is a mobility scooter designed for use on tracks. A powered wheelchair, also known as a **powerchair**, is not built to go on tracks. An **invalid carriage** is defined as including mobility scooters and powered wheel chairs (class 2 or 3) and manually powered wheelchairs (class1) .
<http://www.legislation.gov.uk/cy/uksi/1988/2268/made>

In the British Standard BS 5709 Gaps Gates and Stiles (2006) the term mobility vehicle is defined as a wheeled vehicle such as a wheelchair, invalid carriage or children's pushchair or pram.

representatives from land managers and other user groups were invited to contribute to the design of the trial by participating in the working group.

3.0 Aims and Objectives of the Trial

3.1 Aims

The aims of the trial were to source and trial available and newly designed bridle gates that are efficacious for land managers and are sympathetic to the needs of all potential users, including horse riders and the less able. The trial aimed to identify those critical features of gates that make them more or less suitable for land managers and the full range of users. This trial was also intended to inform the revision of the British Standard 5709:2006. It was also to inform work done to promote the correct installation and use of safe, stock proof and robust gates that are easy to use by all legal users, including those with a disability.

3.2 Objectives

The objectives of the trial were:

- 1) To determine whether the gates in the trial can be used safely and easily by a range of users, whilst closing within a time frame to prevent escape of livestock.
- 2) To determine whether the gates in the trial remain adequately stock proof when they are closed.
- 3) To determine whether the gates are both of a robust nature and easy to install by an experienced installation professional.

See Appendix 3 for definitions of ease of use, safe use, stock proof and robust

4.0 Working Group

In order to ensure that the trial was both rigorous and inclusive a working group was invited to advise and input into the work. The key tasks of the working group included: the development a robust methodology, the recruitment of suitable trial participants and those with a livestock interest, input into a final report and agreement on its content and presentation and dissemination of trial outcomes and long term monitoring. The members of the Working Group were requested, where appropriate, to represent the views of their organisations.

Governance

The group initially met on the 2 February 2015 at Askham Bryan College, Yorkshire. Further meetings took place by teleconference as required and on site with Natural England acting as the secretariat for the working group.

The Group agreed the gates to be trialled, the methodology for the installation of the gates, the methodology for conducting the trial, they oversaw the setting up of the trial and they participated as trial managers. Finally the group agreed the content of this report

Membership of the working group

Pippa Langford Chair of Working Group	Principal Specialist Commons and Public Rights of Way	Natural England
Nicola Harper	Senior Adviser in Greenspace and Engagement	Natural England
Alison Hill	Senior Specialist in Social Evidence	Natural England
Mark Weston	Director of Access	The British Horse Society
John Cuthbertson	Director	Disabled Ramblers
Sarah Slade	National Access Adviser	CLA
Matt Jeffes / Martin Rogers	Flood Management and Access Adviser	NFU
Bob Fenton	Team Leader: Countryside Access Team	Herts CC and IPROW
Tom Bindoff	Gate Designer	British Standard Working Group
Kay Lamb	Facilities Director	Askham Bryan Equestrian Centre
Anna Riach	Lecturer in Animal Management and Equine Studies	Askham Bryan Equestrian Centre
Emma Grime	Section Leader	Askham Bryan College
Chris Beney	Chair of BS committee	British Standard Committee

5.0 Methodology

5.1 Guidance/ Standard Operating Procedures

It was recognised at an early stage that a large number of people would be supporting the trial. In order to ensure consistency Guidance and Standard Operating Procedures were developed and approved by the Working Group. The following were issued to the appropriate individuals who were helping to set up and run the trial. See Appendix 4

- Guidance for Gate installation
- Guidance for Stockman
- Guidance for Trial Managers
- Guidance for Participants: this was included in the invitations and was tailored for horse riders, non-horse riders and farmers.

5.2 Gates ⁴

The Working Group agreed to include ten gates in the trial as it was felt that this was the maximum that the horse riding participants could be expected to complete without becoming overtired. We aimed to include a range of design features some of which were recommended in the 2011 trial, and others were novel and not previously tested in Britain.

A number of different strategies were used to identify appropriate designs to include in the trial:

1. Development by Centrewire of design features that aimed to meet the recommendations of the 2011 trial
2. An appeal to members of the BHS, LAFs, IPROW and ADEPT, the BS Working Group, and members of the Bridlegate Trial Working Group, for information about existing gates that they regarded as easy and safe to use.
3. A request to the gate manufacturing industry to put forward gates that they thought best met the criteria.

As a result of the 2011 report the following gates were included in the trial:

- Gate 2 The Original Worcester,
- Gate 3 The modified Worcester MKI
- Gate 4 The modified Worcester MKII.
- Gate 9 A timber 5' gate
- Gate 10 A corresponding timber 8' gate

The Worcester Gate had been tested in the BHS trial of gates in 2011, the modified Worcester gates included alterations to the handle designs, handle position and width of gate in order to meet the recommendations outlined in the report. The timber eight foot gate was included to test the request for increased width; this was controlled by the five foot gate.

- Gate 5 The Portail Equestre

This was included as a result of suggestions made by the BHS members who had seen a YouTube clip of the gate being used in Switzerland and consequently visited the area to see it in operation.

- Gate 6 The Alton Gate

The inclusion of the Portail Equestre prompted Centrewire to develop a modified version of this gate which they believed would include features more suitable to needs in Britain, namely, the inclusion of a latching mechanism and a two way hydraulic hinge self-closing mechanism

- Gate 7 The Chiltern manufactured by Centrewire
- Gate 8 The Compton manufactured by Secure-a-Field.

⁴ Photographs and technical drawings of gates can be seen at Appendix 2, Exhibit 1, Pages 63 - 72.

These were put forward by gate manufacturers as widely used gates. They also provided examples of an off-set hinge mechanism and one-way closing.

We also received a number of other suggestions, but after investigation we discovered they were for gates that were the same as those already included in the trial but marketed under a different trade name. A number of retailers did not make their own gates, but sold gates of a small group of manufacturers. In the end only the two companies listed above put their gates forward to be included in the trial.

Table 1: Description of the gates included in the trial

Trial Number	Gate Description	Reason for inclusion (additional to reliability of closure)	Manufacturer
Gate 1	Two-way non self-closing wooden gate with an in-line 2-way catch and Bridle latch handle. Width 1.52m	This is providing a control for the non-self-closing gates against which the performance of self-closing gates can be assessed.	Centrewire
Gate 2	Original Worcester: Two-way hydraulic self-closing metal gate with an in line 2-way catch and Bridle latch handle. Width1.52m.	This is commercially available and was tested in the BHS Trial 2011.	Centrewire
Gate 3	Modified Worcester MK 1: Two-way hydraulic self-closing metal gate with a 2 way auto-catch and a retractable D loop latch, it has a Bridle latch handle. Width1.73m.	To test: the D loop latch to see if it improves safe use To test the extra width to see if it improves ease of use and safe use	Centrewire
Gate 4	Modified Worcester MK2: Two-way hydraulic self-closing metal gate with a 2 way auto-catch and a retractable D loop latch with bush and lighter return spring. It has a stock proof handle. Width 1.73m	To test: the improved D loop latch to see if it improves ease of use upon the MK1. To test the stock proof handle.	Centrewire
Gate 5	Portail Equestre: Metal gate with a rising self-closing pivot hinge and a ring handle mounted above the gate, no latch supplied. Width 1.54m	To test the novel ring mechanism for ease of use and safe use	Constructeur Metallique
Gate 6	Alton Gate: Delayed action Pro-Safe two – way hydraulic self-closing metal gate with a ring handle mounted above the gate, with a 2 way autocatch and a retractable D loop latch. Width 1.80m.	To test whether the novel ring mechanism improves ease of use and safe use To test whether the latch mechanism functions on this gate design To test whether the hydraulic hinges improve ease of use and safe use.	Centrewire

Trial Number	Gate Description	Reason for inclusion (additional to reliability of closure)	Manufacturer
Gate 7	Chiltern one-way offset hinged self-closing metal gate with a one way auto-latch and Bridle latch handle. Width 1.5m	To test a gate in widespread use To test a one way self-closing gate in comparison with two-way self –closing gates. To test off-set hinges in comparison to hydraulic hinges	Centrewire
Gate 8	Compton two-way self-closing metal gate with off –set hinges and in-line 2 way catch and Bridle latch handle. Width 1.5m	To test a gate in popular use To test off-set hinges in comparison to hydraulic hinges	Secure–a–field
Gate 9	One way self-closing Timber gate with offset hinges. Equipped with one way auto-latch and a double trombone handle. Width 1.54m	To compare with gate 10 To test whether the double trombone handle improves ease of use or safe use	Centrewire
Gate 10	One way self-closing Timber gate with offset hinges. Equipped with one way auto-latch and a double trombone handle. Width 2.11m	To test whether the wider gate improves ease of use and safe use. To test whether the extra weight of the gate neutralises any advantage gained from width. To test whether the double trombone handle improves ease of use or safe use	Centrewire

Note: Detailed specifications in Appendix 4a

5.3 Trial Site

5.3.1 Description of trial site

The trial took place between May 2015 and September 2015 in an area of Cottage Field, Askham Bryan College, Askham Bryan, York. The site was chosen for its near to flat terrain which assisted accessibility for both the disabled and for horse boxes. Askham Bryan Equestrian Centre provided the opportunity to leave the gates in situ for a long period of time, access to staff who were able to install the gates and staff who were able to manage the stock testing. A further advantage was that the Equestrian Centre was well rehearsed in holding large events and facilitated contact with a significant number of equestrian participants.

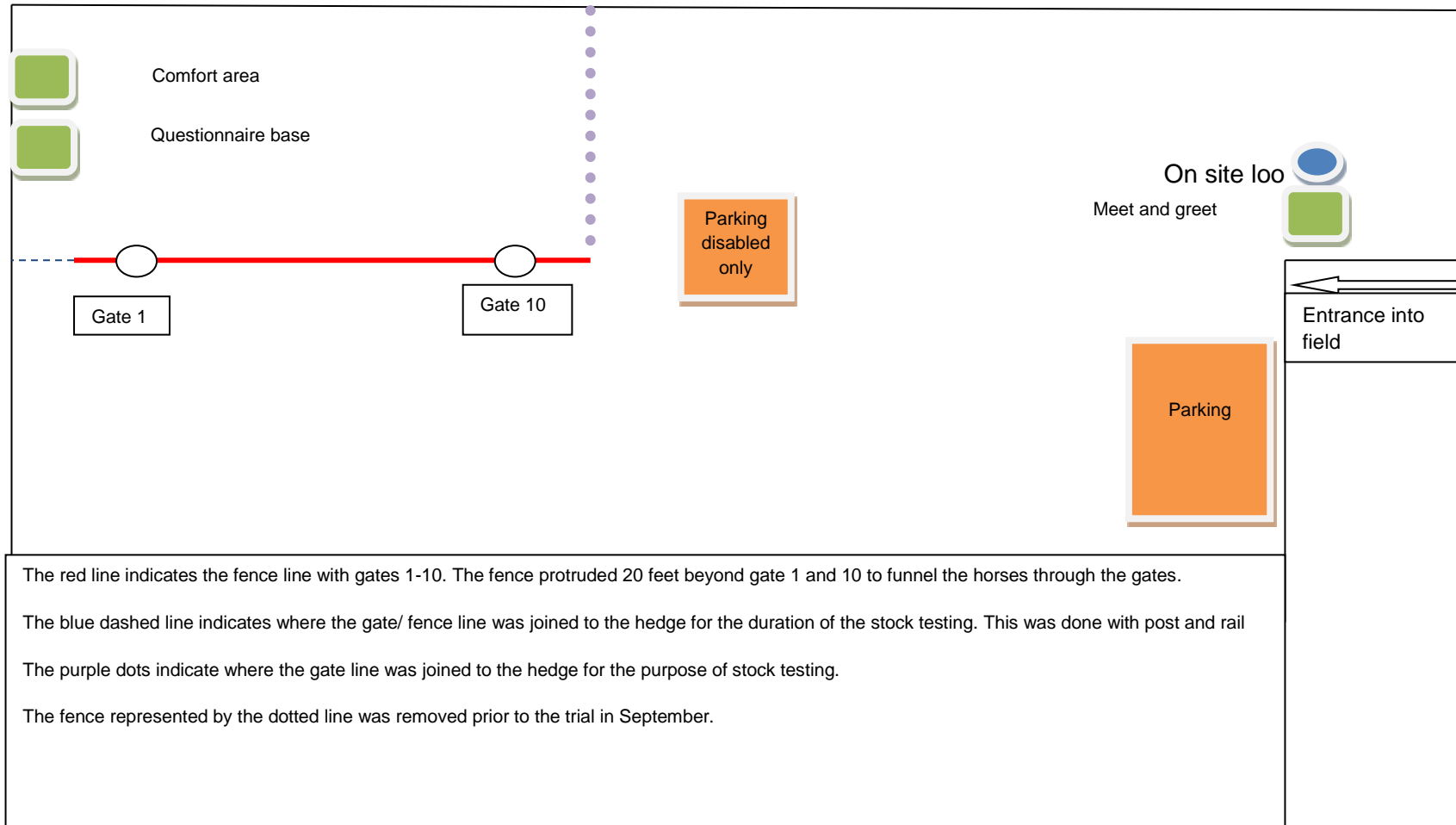
A diagrammatic map of the temporary paddock that was created for stock testing is included below.

5.4 Trial protocol

Table 2: Overview of stages

Stage	Activities	Timing
1	Installation of the gates and fence	WB 25 May 2015
2	Checking for correct installation	WB 4 June 2015
3	Pre-trial testing	WB 4 June 2015
	Silage cut 1	WB 4 June 2015
4	Revision of questionnaires	22 June – 28 Aug 2015
5	Stock testing	20 July – 12 Aug 2015
6	Recruitment of participants and trial managers	20 July – 17 Sept 2015
7	Final gate check	WB 7 Sept 2015
8	Training video created	WB 7 Sept 2015
9	Main trial Stage	17 – 24 Sept 2015

Diagram 1: Cottage Field during the period of stock testing and during the trial



5.4.1 Trial Preparation Stages

Stage 1 Installation of gates

Gates were arranged in a linear fashion from the westerly hedge towards the East, starting with Gate 1 and ending with Gate 10. Gates were separated by 5.5m of post and rail fence to give ample manoeuvrability between the gates. The gates and fences were installed by an experienced gate installer, who routinely does work for Askham Bryan College.

Stage 2 Checking of gates

Following installation, opportunity was provided to the British Manufacturers to inspect and correct any defects in installation. Both Centrewire and Secure-a-Field attended. A number of gates were altered in order to provide the best closing time and alterations made to the handles of gates 9 and 10. The manufacture of Gate 5, Constructeur Metallique, was not invited to inspect the gates due to the impracticalities of distance for their personnel.

The gates were also checked for compliance with BS 5709: Gaps, Gates and Stiles. A number of alterations took place as a result of this including changes to the fence posts.

At the beginning of the trial it was deemed that with the exception of Gate 5 the gates met the BS and were installed to satisfaction of the gate manufacturers.

The gates were numbered as per Table 2 and each gate was labelled on both sides, north (n) or south (s)

Stage 3 and 4 Pre-Trial Testing and development of the questionnaires

In order to test and develop the methodology and finalise arrangements for participants a pre-trial dummy run was undertaken on the 4 June. The aim was to:

- test the limitations to the number of gates horse riders would be able to attempt
- test the content and structure of evidence gathering questionnaires
- check the practicalities of filming
- check and revise the guidance required for participants and volunteers for the main trial
- agree the number of assistants needed for the main trial and agree their tasks
- assess the facilities needed (for example marquees, toilet, furniture etc.)

A class of equestrian students from Askham Bryan College participants were provided with an Information Sheet and Informed Consent Form for Participants and asked to complete a Data Consent Form, Background Questionnaire, and Gate Questionnaires. They rode through the gates supervised by their tutors and their passage was filmed using a pair of GoPro Hero Mk3+ video cameras positioned either side of the gate.

During this stage it was observed that almost no participants had experience of using gates or used the BHS recommended position of 'heels to hinge'. The Working Group concluded that it would be a useful addition to the trial to see if a simple training video shown to participants before undertaking the trial would have an impact upon gate use. Stage 7; creating a BHS training video was therefore added, and a small sample of trial participants were shown the video before completing the trial.

It was decided that to minimise fatigue with the horses, they should only be required to pass through each gate in one direction: either, north to south, or south to north.

Checking of completed questionnaires highlighted the need to change several questions to ensure data could be correlated. The layout of the questionnaires was also modified in an attempt to make them easier and quicker for participants to complete.

It was agreed that a minimum of five people (and ideally eight) would be needed to support the smooth running of the trial.

Stage 5 Stock Testing

The Working Group considered it essential that all of the self-closing gates were tested to find out if they were stock proof. Stock proof testing had never been carried out in a methodical and controlled manner on gates prior to this trial. Therefore a system needed to be developed; it was advised that the best way to undertake this was to use cattle cake to tempt the cattle to try to gain access to the other side of the fence through the gates.

Working in partnership with the College's farm manager heifers were chosen to test whether the closing mechanisms were resilient to pressure and rubbing by stock. Sheep were not tested as they were considered more likely to escape as a result of gaps which could be corrected by a mesh.

A paddock within the field was created by joining the fence line to the existing external fencing as shown in diagram 1. Seven heifers were placed either side of this post and rail fence. The gates had been installed so that the one way opening gates would be opened from the paddock to the wider field.

The heifers in the outer paddock were fed with cattle cake 10 feet from the line of gates. It was considered that the heifers in the inner paddock would see the other animals feeding on the cattle cake and make attempts to pass through the gates to join them. Each gate had a piece of string loosely tied at the top, bottom and middle in such a way that the strings would fall if the gate was opened.

The heifers on one side of the gate were marked to make them easily recognisable to the stockman when checking the cattle. The cattle and gates were checked daily, the stockman was asked to:

- a) note if any had got through the gates to the other side of the fence;
- b) check each gate in turn to see if there is evidence that the gate has been opened either by observing that the gate is resting on the latch or that the strings had fallen off.

Only the non-self-closing control gate was found to have been opened; this occurred on one occasion, during the two week trial period.

Stage 6 Recruitment of Participants and Trial Managers

As set out in the aims of the trial, the recommendations of this trial should take account of the needs of all potential users including horse riders and the less able. To ensure that these aims were met and the gates were thoroughly tested, participants from the following groups were invited to join the trial:

- Adult walkers of all ages and abilities
- Adult horse riders of all abilities
- Adult cyclists of all ages and abilities, but preferably those who went off road
- Adults with physical and / or mental impairments including mobility scooter and wheelchair users
- Farmers and people related to farming.

This range of participants meets the recommendation of the 2011 British Horse Society trial to test the gates with users with a full range of disabilities.

All participants had to be available on certain days at the pre-selected trial site and willing to be both videoed completing the trial and to give their views on each of the gates afterwards. It was decided that insurance, supervision and complications around gaining informed consent meant that it was not possible to recruit children.

To recruit sufficient numbers that fell into each of the above categories national organisations were contacted both through the network of the Working Group and by direct contact as well as small local groups, See Appendix 5b. In addition, a press release was issued inviting readers to directly contact us. The full list of organisations that participated is given in Appendix 6. The profile of the participants is given in Section 6

The numbers of participants taking part in the trial were not large enough and not recruited in a manner to allow the data to be analysed quantitatively. However, the data generated a wealth of descriptive statistics and permits detailed examination of the ways in which people with different needs, experiences and preferences approach bridle gates with new or familiar design features.

The Trial Managers were all volunteers from the Bridlegate Working Group, Askham Bryan College, Natural England and the surrounding community. All were given written and verbal instructions. See Appendix 4b

All participants and some of the Trial Managers were unpaid volunteers. The Working Group is very grateful to everyone who came and participated in the trial and those who supported them.

Stage 7 Checking of the Gates

All gates were checked for compliance with BS 5709 to ensure they operated safely during the dummy run, the stock testing, and prior to commencement of the main trial.

At the start of the main trial, the following measurements were taken:

- closing time from a stationary maximum opening, to latching
- measurements of the force required to open each gate.

Stage 8 BHS Video

On the 27th August the BHS filmed a short [video](#) to instruct riders on the technical aspects of opening bridle gates from on horseback. BHS Instructor Jo Winfield FBHS demonstrated the correct technique using a local horse and rider. The horse used in the video is grey which is easy to see even on low resolution screens.

5.4.2 Main Trial Stage

5.4.3 Management of the trial and data

Prior to coming to the trial all participants were notified that they would have to give their consent to be filmed. On arrival at the site each participant was given an information sheet explaining what was being expected of them: that they would be asked to complete two questionnaires and have their passage through each gate filmed. The information sheet explained that the video material was for the use of the trial only, that it would not be shared beyond the project team, that it would only be used for the purpose of the trial research, and that it would be stored and processed in accordance with the Data Protection Act 1998. The information sheet also explained that participants would not have to give any identifying personal information and that they would not be identified in the final report or any other project publications. Participants were asked to sign an Informed Consent agreement if they were happy with the arrangements, and no one withdrew from the trial at this stage.

On arrival participants were issued with an event number to wear; this same number was applied to the Background Questionnaire and the Gates Questionnaire. More information is provided on the background and gates questionnaires below. Numbers were issued as follows: 1 – 99 horse riders, 100 - 199 non-horse riders, and 200 – 299, farmers. Nowhere in the trial is the name of the participant connected to the participant number. All information was available in large font for the visually impaired or scribes were available if preferred and everyone was asked in which format they wanted to have the questionnaires.

Marquees, tables and chairs and a toilet were provided for the convenience of the participants and trial managers. Refreshments were also provided whilst the participants filled in the consent form and background questionnaire and concomitantly waited for their turn to pass through the gates.

The trial was divided for convenience into time periods; those reserved essentially for horse riders and those reserved essentially for non-horse riders. This reduced the possibility of errors in the administration of the questionnaires, as well as aiding the efficacious arrangement of the support volunteers across the site. Farmers were invited to attend during a horse-riding period, in order that they could observe a number of horses passing through the trial gates.

5.4.4 Background Questionnaires

A background questionnaire was tailored to each of the three groups of participants. It was designed to gather evidence that would reveal any physical factors that influence the use of the gates and to show if different user groups are differentially advantaged or disadvantaged by any facet of gate design. In the case of farmers extra questions were included to probe their past and present experience of bridle gates.

5.4.5 Participants passage through the gates

The pre-trial dummy run showed that it was too much for each horse and rider to pass through all of the gates in each direction. Therefore a system was devised in which each horse riding participant alternated passing through gates from the north and south side. As a result each participant went through each of the gates half from the north and half from the south. For instance, rider A would approach the gates as follows: 1,3,5,7,9 from the south and 2,4,6,8,10 from the north, whereas rider B. would approach the gates as follows: 1,3,5,7,9 from the north and 2,4,6,8,10 from the south.

In order to ensure that all gates were approached by riders from the south and from the north, and to eliminate bias due to tiredness, the 'start' gate moved with each new batch of two to three riders, firstly along the north side and then along the south side.

Riders were instructed that should they or their horse experience tiredness, they should either rest and recommence, or retire from the trial. They were also instructed that should they or their horse find a gate too difficult to negotiate the gate would be opened for them and they could go onto the next gate.

In order to give the horse riders sufficient time to complete the trial, and trial manager's sufficient scope to collect the data, a timetable was created. A maximum of 3 equestrians were timetabled per hour for external participants. For equestrians from Askham Bryan we had to timetable 5 per hour to accommodate study timetables. This proved difficult to adhere to and on one occasion the trial session had to be terminated due to a deadline being reached.

Non-equestrians and farmers were requested to pass through each of the ten gates, approaching from both north and south. Most participants began at Gate 1 and ended at Gate 10. It was not considered necessary to rotate the start gate as we did not consider that tiredness was a large issue. As with equestrians, non-equestrians were instructed that should they experience tiredness, they should either rest and recommence or retire from the trial. They were also instructed that should they find a gate too difficult to negotiate, that a trial manager would open the gate for them.

Although some participants arrived at the trial site on their own and some passed through the gates by themselves, most participants went through the gates one after the other, as a group, often with people that they knew. We therefore acknowledge that some participants were influenced by their fellows, both in the approach to using the gate and in the information that they supplied in the gate questionnaires.

Five horse riding participants were shown the training video immediately before commencing the trial. Some of these participants were not experienced in the use of gates, whilst two regularly rode out on a route which requires the use of bridle gates. Observations about the

approach of these riders were made using the same assessment methods as for all other participants.

5.4.6 Gates Questionnaire

Gates questionnaires were provided for each participant. In the case of the equestrians they were provided as containing the odd south/ even north or vice versa.

The gate questionnaires for equestrians and non-equestrians were structured to draw out the thoughts of the participant regarding the safe use and ease of use of each of the gates in both directions. In particular the questionnaires sought answers regarding the handle/latch and closure. The questionnaires consisted of set questions about each gate and free text questions were included asking about particular 'likes' and 'dislikes'. The farmers' questionnaire also sought opinions regarding safe use and ease of use, particularly in respect to the handle/latch and closure times.

An assistant was provided if necessary to accompany the participant around the trial to either hold the questionnaires or to hold and fill in the questionnaires. This was found to be particularly useful for equestrians.

After passing through the gate the participant was asked to fill in the questionnaire before going onto the next gate. This avoided confusion and ensured participants gave equal time to their responses for each gate.

Background questionnaires can be found at Appendix 7a-c and Gate questionnaires can be found at Appendix 8a-c

5.4.7 Video Evidence

The aim of filming was to provide a consistent and objective assessment of the participant's passage through the gate. The passage of the participants through the gate was filmed from both sides of the gates using GoPro Hero 3+ video cameras; these were mounted on chest harnesses. The information was recorded on SD disks changed daily; batteries were changed at 2 hourly intervals. The camera operators stood on a marked spot either side of the gate and followed the individuals passing through the gates down the line.

The video evidence was assessed against criteria tailored to equestrians and non – equestrians see (Appendix 9).

6.0 Profiles of the Gates Trial Participants

As discussed in the Methodology section 5.4.3 (page 16), particular categories of users were targeted to ensure they were adequately represented. Participants were recruited by targeted invitation to organisations known by members of the Working Group, and this created a self-selecting sample of people who were available to be on the Askham Bryan College on the dates set. Participants also had to be willing to be both videoed completing the trial and to give their views on each of the gates afterwards.

The methodology emphasised the value of qualitative evidence. Finding out how the relatively small number of participants approached each gate, and what their perceptions were, compared to the video evidence of their passage through each gate, was essential to the trial. These factors influenced who was available, and hence the results achievable. For this reason the descriptions of each participant group (below) are illustrative. They highlight key features and set these in the context of the most relevant data available on visits to the countryside.

In total 101 people participated in the trial. Of these 67 were female and 34 were male. no participants were under 16 years of age. As mentioned in the Methodology the Working Group agreed that securing consent to film young people for the research, and to agree the protocol for analysing the recordings, would have delayed a schedule that was necessarily built around accessibility to the field at Askham Bryan College where the trial gates had been installed.

Overview of visits to the natural environment

In order to assess whether the horseriders and non-horseriding participants in the trial were representative of the users of the countryside as a whole, the data collected in the background questionnaires has been compared to Natural England's Monitor of Engagement with the Natural Environment (MENE) survey⁵. The survey collects data to show how people in England engage with the environment. It collects data from between 46,000 to 49,000 people per annum and has been shown to reflect the population as a whole⁶.

Between March 2015 and February 2016 there were an estimated 1356 million visits to the countryside⁷ according to (MENE) survey⁵ The report breaks these down in to the different categories of places visited. Table 3 shows the visits to the countryside broken down by specific type of place.

⁵ Natural England (2016) Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment-Quarterly report – December 2015 to February 2016. Accessed online from www.gov.uk June 2016.

⁶http://webarchive.nationalarchives.gov.uk/20140711133551/http://www.naturalengland.org.uk/Images/mene-stats-faq_tcm6-37788.pdf

⁷ Including areas around towns and cities

Table 3: Volume of visits to the natural environment by specific place visited

(millions of visits and percentage of total) March 2015-February 2016

Specific type of place visited	Visits (millions)	Percentage of all visits to the natural environment
Path, cycleway, bridleway	519.9	16.6%
Farmland	224.3	7.2%
Another open space in the countryside	294.5	9.4%
Mountain, hill, moorland	83.9	2.7%

Source: MENE 2016 ⁸

The full Annual Report on the 2015-16 MENE survey was unavailable at the time of writing, but the 2014-15 MENE survey estimated that 456 million visits to the natural environment involved spending time using paths, cycle ways and bridleways. Almost a quarter of these visits (24%) take place in the countryside (including areas around towns and cities)⁹. Most of the visits that involved using paths, cycle ways and bridleways were either on farmland (62.2 million) or other open spaces in the countryside (58.1 million).

Table 4 below shows that most horse riding visits take place on farmland, most off-road cycling and mountain biking occurs on paths, cycleways and bridleways. Most walking (with or without a dog) takes place on paths, cycleway, bridleways or other open spaces in the countryside.

⁸ Natural England (2016) Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment-Quarterly report – December 2015 to February 2016. Accessed online from www.gov.uk June 2016.

⁹ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

Table 4: Activities undertaken in different types of place

Data obtained between March 2014-February 2015

Activities undertaken (millions of visits)	Farmland	Mountain, hill, moorland	Path, cycleway, bridleway	Another open space in the countryside
Horse riding	17.3	1.9	9.2	5.2
Off-road cycling or mountain biking	2.3	2.6	9.0	3.1
Walking-not with a dog (including short walks/rambling/hill walking)	41.8	22.5	129.2	76.3
Walking-with a dog (including short walks/rambling/hill walking)	164.6	38.4	255.5	205.1
All activities	245.3	73.4	456.0	337.0

Source: MENE 2015¹⁰

Looking at all the estimated 1313.4 million visits to the countryside between March 2014 and February 2015 shows that the majority of visitors to the countryside did not have a disability, and women slightly outnumbered men as countryside visitors (Table 5 below). A quarter of visits to the countryside in 2014-15 were by people aged 45-54 years and the lowest proportion of visits were taken by those aged 16-24 years¹¹.

Over half of visits to the countryside in 2014-15 involved walking with a dog, whilst walking without a dog accounted for almost a quarter of all countryside visits (see Table 6 below). Horse riding and off-road cycling/mountain biking each accounted for 2 per cent of all activities undertaken in the countryside.

¹⁰ Natural England (2016) MENE Online Cross Tabulation Viewer (Q4 xQ5). Accessed online from www.gov.uk June 2016.

¹¹ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

Table 5: All visits to the natural environment with comparison to the population as a whole

Data obtained between March 2014 and February 2015

		Volume of visits (millions)	Percentage of all visits to the natural environment	Profile of population for comparison
Gender	Male	640.8	48.8%	49.0%
	Female	672.6	51.2%	51%
Age	16-24	95.6	7.3%	14.1%
	25-34	155.3	11.8%	16.8%
	35-44	204.1	15.5%	16.0%
	45-54	320.0	24.4%	17.5%
	55-64	251.2	19.1%	14.2%
	Over 65	287.2	21.9%	21.0%
Disability	Yes	196.3	15.0%	11.6%
	No	1116.9	85.0%	88.4%

Source: MENE 2015¹², ONS 2015¹³

Table 6: Activities undertaken in the Natural Environment

Data obtained between March 2014-February 2015

	Number of visits (millions)	Percentage of all visits to the Natural Environment
Walking, with a dog	758.1	57.7%
Walking, not with a dog	316.8	24.1%
Horse riding	29.3	2.2%
Off road cycling/mountain biking	20.2	1.5%

Source: MENE 2015¹⁴

¹² Natural England (2016) MENE Online Cross Tabulation Viewer (Q2 x Total, Gender, Age, SEG, Working Status, Disability & Ethnicity). Accessed online from www.gov.uk June 2016.

¹³ <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimate/bulletins/annualmidyearpopulationestimates/latest>

Ramblers

Walking – either with or without a dog-is by far the most popular activity recorded by the Monitor of the Engagement with the Natural Environment (MENE) survey. Between March 2014 and February 2015 there were an estimated 1074.9 million walking visits to the countryside (including short walks, rambling and hill walking) of which walking without a dog accounted for 316.8 million visits (29.5%) and walking with a dog accounted for 758.1 million visits (70.5%).

In the gates trial only three walkers were accompanied by dogs. Two visually impaired walkers took their assistance dog through the gates and another walker was accompanied by her pet dog.

Nineteen of the forty six ramblers in the gates trial declared a disability. Of these fifteen said mobility affected their enjoyment of the countryside, three mentioned vision impaired their enjoyment of the countryside, one person said that manual dexterity affected their enjoyment of the countryside and one person mentioned their memory affected their enjoyment of the countryside.

Table 7 Mobility or visual aid used by gates trial participants by gender and age

Mobility or visual aid used for gates trial	Number		Age/Age range (years)
	Male	Female	
Sighted guide/personal assistant	2	1	42-61
Guide Dog/assistance dog	1	2	42-61
Long cane	1	1	42-51
Attended wheelchair	-	1	80
Self-propelled wheelchair	1	-	61
Powered wheelchair	2	1	47-61
Off-road scooter/mountain trike/Tramper	5	3	33-75
Pavement scooter	-	1	68
Walking stick or pole	5	2	60-81

Twenty one participants used a mobility or visual aid (as described in Table 7 above). Three people said they used a personal assistant or sighted guide when visiting the countryside, one of whom was the user of a powered wheelchair. Two people trialled the gate with their Assistance Dogs and again with long canes. The one woman who stated that she usually used a long cane, trialled the gates with a sighted assistant.

¹⁴ Natural England (2016) MENE Online Cross Tabulation Viewer (Q2 xQ4). Accessed online from www.gov.uk June 2016.

Horse Riders

Horse riding accounted for just over 27 million visits to the natural environment in England in 2015 (0.9 per cent of all visits)¹⁵. The majority (88 per cent) of these visits are taken in the countryside (including areas around towns and cities)¹⁶.

Three quarters of horse riders are female according to the 2015 BETA National Equestrian Survey¹⁷. The 2014-15 MENE survey¹⁸ estimated that 86 per cent of horse riding visits to the natural environment were taken by women. 91 per cent of the gates trial horse riders were female.

The four male horse riders who took part in the trial ranged from 52 to 69 years old. The forty five female horse riders ranged in age from 17 to 87 years old. The MENE survey reports that just under five per cent of all horse riders making visits to the natural environment are aged 65 and over¹⁹. In the gates trial fourteen per cent were aged 65 and over: two men and five women.

The BETA 2015 survey highlights an increase of 35,000 horse riders aged 16-24 since their 2011 survey, taking the overall total to 403,000 overall²⁰. The MENE survey reports 5297 horse riding visits by 16-24 years old in the 2014-15 survey year, or 16 per cent of all horse riding visits. This is a slight increase from the 12 per cent of horse riding visits undertaken by 16-24 year olds in 2010-11²¹. Twelve gates trial horse riders (24%) were aged 17-18, all female.

The 2014-15 MENE survey shows that nine per cent of horse riders have a declared disability. Four of the forty nine horse riders in the gates trial declared a disability (Table 8 over page), and although this is a similar proportion the actual number of participants was too small to reflect the range of disabilities in the wider horse riding population. Hearing impairment, age related mobility impairment and hand pain were specifically mentioned by disabled riders in the gates trial and three of these riders were also aged 65 and over.

Of the other horse riders one man mentioned that his severe joint pain often affects his choice of route when riding. One female rider reported manual dexterity problems. One female rider had arthritis in the hands, arms and neck and a male rider had osteoarthritis.

¹⁵ Natural England (2016) Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment-Quarterly report – December 2015 to February 2016.

Accessed online from www.gov.uk June 2016.

¹⁶ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

¹⁷ British Equestrian Trade Association (2015) National Equestrian Survey 2015 Key Facts. Accessed online from www.beta-uk.org June 2016.

¹⁸ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

¹⁹ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

²⁰ British Equestrian Trade Association (2015) National Equestrian Survey 2015 Key Facts. Accessed online from www.beta-uk.org June 2016.

²¹ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

Table 8 Declared disabilities and other health conditions of gates trial horse riding participants by gender and age

Gender	Number of participants	Age range (years)	Declared disability or other condition
Female	45	17-87	5
Male	4	52-69	3

All the horse riders usually enjoyed visits to the countryside by horse or pony, and just under half (23 out of 49) also walked or rambled in the countryside (including all four male horse riders). Eight said they also enjoyed the countryside by bicycle.

The majority of the riders (39 out of 49) usually ride a horse between 14.2 and 16.2 hands, and 33 of these rode a horse of the same size for the gates trial (Table 9). Two riders rode a horse over 16.2 hands for the gates trial when they usually ride a horse between 14.2 and 16.2 hands. Of the seven riders who rode a horse under 14.2 hands in the gates trial six usually ride larger horses (14.2-16.2 hands). Of the nine riders who usually ride a horse over 16.2 hands five rode smaller horses (14.2-16.2 hands) for the gates trial.

Table 9: Size of horse ridden in gates trial compared to usual horse ridden

		Size of horse ridden in gates trial		
		Less than 14.2 hands	14.2 – 16.2 hands	Over 16.2 hands
Size of horse usually ridden	Less than 14.2 hands	1	-	-
	14.2 – 16.2 hands	6	33	2
	Over 16.2 hands*	-	5	3

Note: Of the 49 horse riders only one rider omitted to say what size horse they were riding in the trial

Table 10: Horse riders participating in the gates trial by gender and height.

Gender	Number of participants	Height (metres)	
		range	mean
Female	45	1.52-1.79	1.65
Male	4	1.63-1.83	1.72

Fifteen of the forty nine horse riders said they were very confident when negotiating gates in the countryside and of these four had Pony Club qualifications, two had BHS Diplomas and one had more than 40 years horse riding experience. Nine of these very confident horse riders had no riding qualifications. Three of the four male horse riders were very confident using gates. About half (25 out of 49) of the horse riders were fairly confident when using gates in the countryside.

Seven riders said their confidence depended on the horse they were riding and only one of these had been involved in, or witnessed, an accident involving a gate. One rider who'd had more than one accident where either she or her horse had been injured said her confidence was affected by her chosen route.

Only one horse rider declared herself to be 'not at all confident' using gates even though she had neither been involved in nor witnessed an accident involving a horse or horse rider using a gate. This 18 year old female had a BHS Diploma.

Eight riders (seven women and one man) had witnessed an accident involving either a horse or rider using a gate. Half said they were very confident when using gates whilst horse riding and half were fairly confident.

Five riders had sustained injuries involving a gate. Two had been involved in more than one accident involving a gate. The one rider who remained very confident using gates in spite of these injuries had more than 40 years riding experience. The other four remained either fairly confident using gates or their confidence depended on either the route they were taking or horse they were riding.

Farmers

The number of farmers who participated in the gates trial was far too small for any meaningful comparison to be made with the wider farming population. However, it is worth highlighting a few statistics from Farm Structure Survey 2013²². In England 96 per cent of holdings were owned by 'sole holders²³', and they were predominantly (84%) male. About a third of holders are over 65 years of age, and only 3 per cent of holders are aged under 35 years old. The majority of holders aged over 65 were found on non-classified farm types,

²² Department for Environment Agriculture and Rural Affairs (2015) Farm Structure Survey 2013 : focus on agricultural labour in England and the United Kingdom. Accessed online from www.gov.uk June 2016.

²³ Where ownership is divided the remaining owners that work on the holding were recorded in the Survey as spouses, other family labour and non-family labour.

and they also tended to have smaller farms. No information was collected to say whether the farmers in the gates trial were farm holders, managers or farm workers.

Seven farmers completed the gates trial: four men and three women. The four men ranged in age from 28-61 years and the three women from 30-51 years. None of the farmers declared a disability or any limiting health condition. The height range of the men was 1.85m-1.88m (average of 1.87m). For the women farmers the height range was 1.63m-1.79m (average of 1.72m).

Of the six farmers that had livestock on their farm five had beef or dairy cattle, four had sheep, one had goats and outdoor poultry, one had outdoor pigs, and another had horses and deer. The farmers who had outdoor pigs and outdoor poultry were two of the youngest and this, coincidentally, is consistent with national trends for farm holders aged under 45 who tend to work on mixed livestock, or pig and poultry farms²⁴.

All seven of the farmers had public footpaths and two had permissive footpaths. Two of the farmers also had public bridleways on their land. None of the farmers had permissive bridleways. There are an estimated 188,500km of recorded public rights of way in England²⁵, but there are no available statistics giving a national picture of the length of footpaths and bridleways on agricultural land.

The only participating farmer who had a gate on their land had one public bridleway, four public footpaths, and one permissive footpath on their land. The individual described the gate as metal and non-self-closing, and reported that the public leave it open, that it's opened by stock and that stock follow users through it. The participant farmed both cattle and sheep. They reported maintenance problems with gates, but no injuries or accidents involving either people or horses.

Cyclists

Off-road cycling and mountain biking accounted for 20.2 million visits to the countryside in England between March 2014 and February 2015 (1.5 per cent of all visits to the countryside, including areas around towns and cities)²⁶. In the gates trial eight of the participants were cyclists. None of them declared a disability, and none use any mobility or visual aids (Table 11). One cyclist had a weak back and the oldest cyclist used a walking stick when walking.

The two women and six men ranged in age from 27-71 years old.

²⁴ Department for Environment Agriculture and Rural Affairs (2015) Farm Structure Survey 2013: focus on agricultural labour in England and the United Kingdom. Accessed online from www.gov.uk June 2016.

²⁵ From conditions surveys in England quoted in Riddall J and Trevelyan J (2007) Rights of Way: A Guide to Law and Practice, Ramblers Association and Open Spaces Society

²⁶ Natural England (2016) MENE Online Cross Tabulation Viewer. Accessed online from www.gov.uk June 2016.

Table 11 Cyclists participating in the gates trial by gender and height.

	Number of participants	Height (metres)	
		range	mean
Female	2	1.68-1.83	1.76
Male	6	1.65-1.98	1.80

7.0 Handling of data and criteria for analysis

Hypotheses had been created for analysing the data (Appendix 9a-c), but the evidence generated from the trial had to be prepared, and this involved the following tasks:

- Creation of analysis spreadsheets from questionnaire responses
- Extraction of data from the videos
- Storage of the data

Creation of analysis spreadsheets

The data from the background questionnaires, gate questionnaires and the video evidence were manually inputted into a Microsoft Excel spreadsheet. A separate worksheet was created for each of the user categories. Colour coding was used for different categories of data.

The specification of each of the gates was added to the spreadsheet – name and trial number, latch mechanism, handle type, opening force required, closing time, construction (metal or wood), and width. A note was made as to whether the weather was windy at the time the participant completed their passage of the gates.

Responses to the open questions were inputted as narrative from which representative key words were chosen. The open responses provided explanation for some of the responses to the closed questions and enabled the analysis of participant perceptions of ease of use and safety to be done in greater depth.

Video evidence

Criteria for analysis had been developed prior to the trial, and these were refined by assessment of a representative number of videos. The criteria were tailored to each of the user groups.

Once each of the videos had been assessed against the agreed criteria the results were added to the main spreadsheet in the relevant workbook.

Data storage

Initial checks were done to ensure that the same number of signed Informed Consent sheets and completed questionnaires had been submitted. The names of everyone who had signed Informed Consent forms were filed on Natural England's internal records management system in accordance with the Data Protection Act 1998. The video recordings were handled in accordance with Natural England's Personal Information Charter. The data cards

from the cameras were made available only to the people analysing the data and they were stored in a code-controlled locker when not being used. The recordings were also stored on Natural England's records management system, again with controlled access.

8.0 Analysis of data

8.1 Walkers Analysis

Safety

No adult walkers in the trial or their dogs experienced safety issues when using the gates.

We conclude that none of the gates or their features are a hazard to adult walkers in normal use. The latch design on Gate 8 requires a greater clearance at the end of the spring mechanism so that there is a reduced risk of pinching. Gate 5 which has a height of 1.7m and has no lower latch, is not suitable for people of the height of about 1.2m or less.

Ease of use

Most walkers were able to use all the gates easily. Some walkers commented that they found Gates 5 and 6 difficult to use, but the video evidence showed that they were all able to pass through the gates without significant problems. Some walkers reported that they did not like the weight of Gate 10, but all passed through. Many walkers reported difficulties with using the handle on Gate 4 (the stock proof handle) but all walkers were able to open and use the gate.

Handle or Latch

In the trial it was clear that walkers have a strong preference for using the handle on gates rather than the latch even though the latches were easier to reach and required less effort than the handles, particularly on the gate with the stock proof handle.

To avoid walkers struggling unnecessarily with handles that are primarily designed for use when riding a horse it may be helpful to provide clear signage to the latch and bright colouring of the latch mechanism to attract more walkers to use the latch in preference to the handle. This would also be appreciated in particular by walkers who are visually impaired; they commented that they liked the colouring of the latch.

8.2 Cyclist's analysis

Safety

Most of the gates (non-self-closing and self-closing) were safe to use for cyclists, except gates 8, 9 and 10 which closed quickly which could result in trapping of the bicycle reducing enjoyment of the gate. Some cyclists were concerned that gates 8, 9, and 10 might damage their bikes but no damage occurred during the trial.

Ease of Use

All cyclists were able to use the non-self-closing gate easily. Cyclists were also able to use the self-closing gates fairly easily however, a number of factors reduced their enjoyment of using the gate; weight (gates 9 and 10), fast closing (gates 9 and 10), one way closing (gate 7), and the stock proof handle (gate 4).

Handle or Latch

In the trial it was clear that cyclists have a strong preference for using the handle on gates rather than the latch. This is probably because if a cyclist is holding a bicycle in one hand they then only have one hand to operate the gate. Using a latch often requires 2 hands, one to lift the latch, and one to push the gate, whereas using the handle to open the gate only requires one hand as the handle can be used to both operate the latch and push the gate.

Given this requirement for one handed operation it is important to consider the needs of cyclists when designing handles on gates. Stock proof handles require clear labelling to help users identify quickly how to operate them.

8.3 Horse rider analysis

Non-self-closing gates or self-closing gates

A key criterion for the design of gates is that they are as safe as possible for all horses and riders to negotiate. It is clear from the data that non-self-closing gates are less of a hazard for riders and their horses, even though riders have to perform an extra manoeuvre to close the gate manually. In the trial no horse riders or horses were hit by the non-self-closing gate. Overwhelmingly riders comment that the non-self-closing gate feels safe and easy to use. A few comment that they like a self-closing gates but these are a minority. We can therefore conclude that wherever possible non-self-closing gates should be installed in preference to self-closing gates as they are less restrictive and safer.

Safety, incident rates

During the trial there were no significant accidents but on several occasions either the rider or the horse was hit by a closing gate. Every contact with a gate has the potential to cause injury so it is important that the frequency of contacts is considered.

The gate that hit the most horses and riders was Gate 8, hitting 7 horses and 2 riders out of 44, a rate of almost one in five. All the other gates hit only one or two horses or riders, or none.

Gate 8 was a 2 way self-closing gate with an offset hinge. It was the only 2 way gate with an offset hinge in the trial. The other gates with offset hinges were Gates 7, 9 and 10 which were all one way. The other characteristic where Gate 8 varied from gates 7, 9 and 10 was that it was lighter to push open (10N compared to 12N for 7 and 9 and 42N for 10).

Observations at the trial were that riders would often push or pull Gate 8 open only to have it bounce on the hinge and swing closed again at speed. When Gates 7, 9 and 10 were opened they did not bounce on their hinges as frequently as Gate 8. Therefore it is possible to conclude that a critical safety feature is that, when the gate is opened by someone pushing hard against the gate, hinges should be designed so that the gate does not swing shut again with equal force. Due to the high rate of hits, we recommend that Gate 8, in this format, should not be installed for use by horse riders.

Perception of safety

Gates 7 and 10 were rated by over half the riders as 'not safe to use' from the northerly approach, but were each rated as 'safe to use' by over three quarters of participants when approached from the south side. Gate 9 was similarly rated as 'safe to use' by only just over half of riders when approached from the north, but three quarters rated it as 'safe to use' from the southerly approach.

Gates 7, 9 and 10 were all one way gates which, when approaching from the north, riders would have to push the gates to open them. It is therefore possible to conclude that riders perceive that one way gates are less safe to use than two way gates when they have to use them from the push side. This is discussed further in the section on closure time.

The BHS recommended method to safely pass through a gate

The BHS recommended way of opening a gate for greatest safety is commonly called 'heels to hinges' because the horse is positioned parallel to the gate facing away from the gate's hinges. It is considered to give riders most control during the manoeuvre and it is most likely to avoid tack being caught by the gate or latch. The rider approaches the gate's hinges and turns to position the horse alongside the gate, 'heels to hinges', with the latch by the horse's shoulder and the horse's head and neck extending beyond the latch, parallel to the gate. The rider will then either push the gate away from the horse or pull it towards the horse and then manoeuvre through the gate.

Pushing or pulling: which do riders prefer?

Where there was an option for riders to either push or pull the gates in the trial just over half of the gates were pushed to open them and just under half of the gates were pulled open.

Pushing or pulling: which is safer?

Where there was an option for riders to either push or pull the gates in the trial there were 9 incidences of gates hitting horses or riders when pulled, and 3 incidences of gates hitting horses or riders when pushed. These figures exclude Gate 8. We conclude that in the trial pushing a gate was safer.

The approach of the rider – does it affect safety?

174 gates passages were undertaken using heels to hinge: 1 rider was hit, 4 horses were hit, and 1 rider did not get through a gate (gate 9). All incidences were when using self-closing gates. There were no incidents whilst using the non-self-closing gate.

144 gate passages were undertaken head on: 3 riders were hit, 6 horses were hit and 6 riders did not get through a gate. All incidences were when using self-closing gates. There were no incidents whilst using the non-self-closing gate.

88 gate passages were undertaken where the rider attempted to open the gate from a variety of positions. 2 riders were hit, 9 horses were hit and 19 riders did not get through the gate. All incidences were when using self-closing gates. There were no incidents whilst using the non-self-closing gate.

The data indicates that using the heels to hinge method, and pushing the gate is the safest approach. From this data alone it is not possible to determine whether that is due to the

approach, or whether it is because more skilled riders use the heels to hinge and pushing method. This will be discussed further in the section on the training video.

However it is possible to conclude that an important element of providing safe gates, irrespective of other design or rider training issues, is to provide safe manoeuvring space that allows riders to get into the position of heels to hinge. We also conclude that wherever possible 2 way-self-closing gates should be installed in preference to one-way-self-closing gates, riders are then always able to push the gate which is less restrictive and safer.

The viewing of a training video – does it affect safety?

Observation of the practices and outcomes for those participants who saw the training video compared to those who did not shows a clear difference in the way in which participants tackled the gates, and a clear reduction in non-productive attempts at opening all of the gates. Both participants and their horses remained calmer and they managed to pass through the gates much more quickly. In particular the group of 3 Askham Bryan Students who viewed the video performed much better than their peers even at the first gate they tackled, using the heels to hinge and push technique. They continued to employ the heels to hinge approach throughout the trial. The pair of riders who were not Askham Bryan students who viewed the video did not initially adopt the heels to hinge approach on their first gate, but by Gate 3 they had adopted this approach and their passage through the gates consequently improved. Both of these riders were relatively experienced but neither had formal qualifications.

It would appear that the experience of watching the video is beneficial to the performance of the rider when passing through the gates because they were influenced to adopt the heels to hinge approach and then pushed the gate. This resulted in improved quality in the passage of the horse and rider and their safety. This was particularly apparent with equestrian students. However, it is recognised that the number of participants who partook in this section of the trial is limited and so we recommend that the BHS pursue further investigation.

The type of handle

The most common type of handle in the trial was the bridle latch handle; this was on Gates 1,2,3,7 and 8. The gates that required the fewest attempts on the handle were Gates 1, 2 and 8. Most riders did not have a problem with using this type of handle: usually only about four to five riders out of about forty-six required more than one attempt on the handle. For Gate 3, nine riders required more than one attempt and for gate 7 ten riders required more than one attempt.

The only common feature amongst the handles on gates 1, 2 and 8, which is different to the handle on gates 3 and 7, is the angle of the handle leaning towards the slam post. This angle is greater on gates 1, 2 and 8. It is possible that a handle angled towards the slam post²⁷ is easier to use when on a horse than a handle which is vertical. This hypothesis is supported by the number of comments about the handle 'being in a good position'.

Gates 9 and 10 had double trombone handles. Many riders struggled to use Gates 9 and 10 making it difficult to distinguish comments about the handles from more general comments about the gates, although the main positive feature was that the handle was 'easy to reach'.

²⁷ This is the gate post at the latch or handle side of the gate.

Of the forty six riders that attempted that Gate 9 twelve took more than one attempt to use the handle. For Gate 10 eleven of the forty seven riders that attempted the gate took more than one attempt to use the handle.

Gates 5 and 6 had 'ring handles' see photograph 2 on Page 51. For Gate 5, 17 (out of 40) riders took more than one attempt to use the handle, and for Gate 6, 12 (out of 44) riders. However several points should be noted: the video evidence demonstrates that the ring handles were easy to reach and facilitated good control over the gate, the ring handles are a novel introduction and are not found in the English countryside, so for all participants this was their first ever use of this type of handle, there was significant improvement between use of gate 5 to 6 (most of the riders tackled gate 5 and then gate 6) suggesting that if the handle was in common usage riders would quickly learn to use it and benefit from the control that it gave them. Farmers expressed concerns that this form of handle may not be stock proof, whilst this was not borne out in the trial, further long term testing would be advisable.

Gate 4 had a 'stock proof handle' that was almost vertical, but leaning slightly towards the hanging post. This handle requires the user to lift the handle first before pulling it back. Twenty two out of forty three riders took more than one attempt to use the handle, with eight commenting that the handle was difficult to operate. It would be useful to assess if riders find a stock proof handle easier to operate if the handle was angled towards the slam post in the same manner as the handles on Gates 1, 2 and 8.

Given the difficulties that riders experience using this handle we conclude that stock proof handles should only be considered for use where there are cattle present and: a) more experimentation is required to see if stock proof handles can be made easier to use and b) stock proof handles in the current format should only be used where the result of cattle escaping could result in accident or great inconvenience to the farmer.

Type of handle and hazardous features

Overall in 448 gate attempts by horse riders, 3 horses had some sort of collision with a handle on a gate: one each on gates 3, 4 and 10. However forty seven riders made comments about the risks to the horse either through collision of the horse's head with the handle or the risk of entanglement; so there is a rate of less than one in one hundred actual accidents compared with almost one in ten opinions that there is a risk. We can conclude that the risk to horses from handles is small, but it is perceived to be much greater than we observed.

The relationship of width, force to open the gate and closure time

There are three factors that determine the size of the opening available for the horse and rider to pass through:

- a) the width of the gate;
- b) the extent to which a rider can open the gate (which relates to the force required);
and,
- c) how long the gate remains open at a width that allows the safe passage of the user.

Width of gate

The minimum statutory width for the opening between the posts with a bridle gate is 5 feet (Highways Act 1980 s145) or 1.52m. The gate openings within the trial varied from 1.50m to 2.11m width. Some riders have hypothesised that wider gates would be safer as they would provide more space for a horse to pass through. This was factored in to the selection of gates used in the trial. The figures that are given in the narrative are the width of the gate openings rather than the width between the posts which can be seen in the technical specifications at Annex 4a, Exhibit 1.

For all the gates at about the statutory minimum width there was only one positive comment about the 'good width'. Riders appear to notice and comment positively upon the greater width of gates when they are 1.70m wide or more. We conclude that riders find slightly wider gates (1.70m) to be easier to use, but there appears to be no benefit to having a gate wider than 1.70m.

The effect of the force required to open a gate

Within the trial there were a high number of variables in gate and handle design which affect rider's abilities to pass through a gate, as well as the force required to open a gate. To assess the impact of the force required to open a gate upon riders it is therefore necessary to compare gates of similar designs. This is possible by comparing all the 2 way opening gates of a 'traditional' design, (gates 1-4 and gate 8), but excluding gate 8 from consideration because of its characteristic to bounce on its hinges which is an additional feature which made this gate difficult for many riders.

The force required to open the gates was measured using a spring balance and varied from 6N (Gate 1) to 42 Newtons (Gate 10). See table 12 over page.

It is possible to conclude, from the data and comments about Gates 1-4 that riders find it easier to negotiate gates that require less force to be opened, and that a force of no greater than 18 N is preferable. Many riders find that gates that require over 20 N of force to be opened are 'heavy to use'.

There is also a relationship between the force required to open a gate and the position of the handle, which affects the length of the lever from push point to hinge. Whilst in theory the longer the lever the greater the force that can be exerted, account has to be taken of the physical characteristics of riders and horses combined which also affects the ideal position for a handle.

Table 12 Force required to open the gates

Force N (Newtons)²⁸	Failures to pass through	No of participants	Gate number
6	0	47	1
10	4	45	8
10	2	43	5
12	2	44	7
12	7	48	9
14-18	1	43	3
18	1	43	4
20	4	44	6
20-22	3	46	2
42	5	49	10

Speed of closure

The time taken for a gate to close from its maximum opening time was recorded²⁹. This measurement is only indicative as it does not describe the length of time the gate opening is sufficient for the user to pass through. For a self-closing gate the width of the gate opening available for the user changes as the gate is pushed open by the rider and then closes again and it is affected by the design of the closing mechanism within the hinge.

Riders experienced difficulty with using Gate 8 (closure time 5.0 seconds), this was largely due to the way the gate bounced closed again on its hinges when it was pushed open to its maximum opening point. Over half of riders commented that they did not have enough time when using Gate 8 when approaching from the north, a quarter made the same comment for Gate 8 when approaching from the south.

Two thirds of riders commented that when using Gate 7 approached from the north (closure time 3.5 seconds) they did not have enough time to pass through the gate. Riders would have had to push this gate, however only 2 riders commented that they did not have enough time when approaching the same gate from the south, when they had to pull the gate. This trend of riders commenting that one-way gates close too quickly when they have to push the gate is similar for Gates 9 (closure time 4.0 seconds) and 10 (closure time 5.5 seconds) with about half of riders commenting that both 9N and 10N closed too quickly.

²⁸ 10 Newtons is equivalent to about 1kg force measured on a spring balance

²⁹ This is not a perfect measurement of the performance of a gate in the real world since closure times vary depending on the force applied by the user and the design of the hinge. Also the rate of closure may not be a constant.

For one-way gates it therefore appears that riders require a longer closing time when they have to push a gate to open it compared to when they can pull it. The reasons for this would appear to be simple: a rider who pulls a gate open does not release the gate until the front of the horse (head, neck and shoulders) are passed the open end of the gate; a rider who pushes a gate has to then ask the horse to move into a space which is becoming smaller as the gate is closing.

For Gates 2, 3, 4, 5, 6, there is a consistent pattern. Gates 2, 3, and 4 all have about one quarter of riders who said they did not have enough time to pass through the gate, but for each of Gates 5 and 6 only a couple of riders stated they did not have enough time. Gates 2, 3, and 4 all have a closing time of about 7 seconds. Gates 5 and 6 have closing times of about 5 seconds and 8 seconds respectively. These gates have different hinge systems

From additional data on whether riders held onto the gate or not it can be seen that riders using Gate 5 were more likely to control the gate by holding onto it than was the case for other gates, this was made easier for riders because of the height and design of the ring handle. It is therefore possible to conclude that when riders can easily hold onto gates whilst they are passing through, the actual closing time has less impact upon the ease and safety of use, than when it is more difficult to keep hold of the gate such as with Gates 7, 9 and 10.

Similar data on riders holding onto Gate 6 shows that the rate of holding onto the gate was similar to that for Gates 2, 3, and 4; rather than the higher holding rates seen with gate 5. This is interesting since it would be expected that with a similar design of ring handle, riders would use the gate in a similar way to Gate 5, but they did not. It is therefore possible to conclude that riders did not feel the need to hold this gate, even so, the horses passing through gate 6 were calmer, with a lower rates of horses avoiding gate 6 than gate 5 This strongly suggests that the reason lies with the hinge system and the resultant closing times and/or the mode of closure. Gate 5 was equipped with a rising self-closing pivot hinge, whereas gate 6 is fitted with a modified version of the hinge fitted to gates 2, 3, and 4; this is a delayed action Prosafe 2 way self-closing hydraulic hinge. The closing time on Gate 6 was 8 seconds; because of the delayed action, the hinge pauses at maximum opening before swinging closed at a slightly faster pace than the hinges on 2, 3 and 4.

It is possible to conclude that for riders to have enough time to pass through a gate a closing time of 8 seconds and the hinge on Gate 6 was the best in the trial.

Conclusions relating to horse rider use of gates

The trial demonstrated that the least restrictive and safest gate for horse riders is a 2 way opening non-self-closing gate.

However, the elements associated with the safest self-closing gate are:

- 2 way opening
- Force required to open the gate of no more than 18Newtons (and preferably less)
- Closing time of 8 seconds
- Character of the gate closing the same as experienced with the delayed Prosafe 2 way hydraulic hinge in Gate 6
- Width of 1.7metres
- A handle angled towards the slam post
- If findings of the trial regarding the training video be found to be consistent with further investigation, the training video could be included in general riding training.
- A handle that facilitates control as demonstrated by the ring handle
- Gate latches use a D shaped latching mechanism

8.4 Mobility scooter and wheelchair users

It is important to consider what operations mobility scooter and wheelchair users have to carry out to successfully open and pass through a gate, this is very different to how an able-bodied person uses a gate, whether on foot, bicycle or horse. When mobility scooter or wheelchair user uses a gate they usually need two hands to propel and steer themselves through the gate; this means that when these users open the handle or latch they also have to push the gate open sufficiently wide to give themselves enough time, before the gate latch closes again, to move their scooter forward. Once the user has moved their scooter into the gate opening they then often use their feet or the front edge or bumper of their scooter or wheelchair to push the gate open as this frees up their hands to propel and steer.

Safety

Self-closing or non-self-closing

The non-self-closing gate was the safest gate in the trial; it had the lowest rates of hits of users for any of the gates. Users did not have to push this gate very hard to get it to open so it was less likely to bounce on its hinges and close quickly, and it did not close on users as they passed through.

Hinges and closing speed

The safety of the self-closing gates varied particularly in the frequency with which the gates bounced at the maximum point of opening and closed again with almost equal speed. As mobility scooter and wheelchair users have to push gates open quite hard some of the gates bounced back on a number of occasions hitting the user or scooter. This problem was most marked in Gate 8, followed by Gate 7, which used two-way and one-way offset hinges respectively. Gate 6 was the gate where there were the fewest problems with the gate hitting the users or their scooters or chairs; gate 6 used a delayed action Prosafe 2 way hydraulic hinge system.

Ease of use

Non-self-closing or self-closing

Some users found self-closing gates difficult or impossible to open because they needed two hands to steer and propel themselves and could not hold or push the gate open far enough at the same time. Other users who managed to open self-closing gates quite easily commented that they preferred self-closing gates because they did not have to perform an extra manoeuvre to close the gate after having passed through. It is clear that self-closing gates would benefit all disabled users if changes to the design ensured that all of these users could open the gate.

One-way or two- way

There were several one-way opening gates in the trial, Gates 7, 9 and 10 which need to be pulled when approached from the south. Users commented on all of these gates that they did not like using a one-way gate. From observing these users it is clear that it is difficult for most mobility scooter users to simultaneously open a latch and pull a gate open towards themselves and then manoeuvre through the gate. This requires them to be able to both steer and propel their scooter backwards with one hand whilst holding onto the gate with the other. Most scooter users need to be able to manoeuvre forwards around the end of the gate

whilst still holding it open before being able to let go once they are passed the end of the gate. Only the fittest and most agile of the self-propelled wheelchair users was able to go through the gate backwards with sufficient momentum to avoid the gate. All of this is difficult for most mobility scooter and wheelchair users, and was impossible for some.

Due to the difficulties that many mobility scooter and wheelchair users experience with one-way self-closing gates we conclude that these are not suitable for these users.

Handle or Latch

These users chose to use the handles more frequently than the latches.

Both the powered and the non-powered users frequently found they had to stretch to reach the handle or latch, with powered users having markedly more difficulty. This is because in a powered scooter the user sits well back from the front of the scooter, this is compared to self-propelled chairs where there is nothing in front of the user's feet.

Users were divided about the ease of use of most of the handles and latches except a few which were disliked by most users. Most users struggled to reach the ring handle on Gate 5 and some could not open this gate at all. Most also struggled to reach the ring handle on Gate 6 but were then able to operate the latch.

When attempting to open a handle or latch at full stretch users found it more difficult to manipulate some latches that they found fiddly or ones which required an additional operation to open, such as the stock proof handle. Users liked the application of colours to the handles and latches at the points of use. One user pointed out that the design of the latch on Gate 8 was helpful because it helped them to grip the pin.

It is possible to conclude that users found none of the handle or latch designs particularly easy to use. Further investigation into the mechanics of how wheelchair and mobility scooter users can best use gates, handles and latches would be useful to identify several factors:

- a) The best positioning of the mobility scooter or wheelchair to make it easiest to reach the handle or latch: it may be possible that a position of 'heels to hinge' may make it easier for mobility scooter and wheelchair users as it does for horse riders;
- b) The design of both handles and latches at the appropriate height for mobility scooter and wheelchair users so that they are easier to manipulate from both sides of the gate; and,
- c) The design and positioning of any colouring, marking and instructions for users.

Ideally gates, handles or latches should be easy to use without additional equipment, but some mobility scooter users carry a special pole so an additional investigation into an aid that makes it easier for users to open gates may be helpful.

Force

Mobility scooter and wheelchair users did not comment about the difficulty of opening any of the gates in the trial except Gate 10 which many found difficult to use. This gate requires a force of 42N to open which is more than double that of the next 'heaviest' gate (Gate 6, 20N). However users did comment that some of the gates were lighter than others. It is possible to conclude that these users do not find a gate that requires a force of 42N easy to

use, and gates requiring a force of up to 20N are acceptable, but lighter gates would be even better.

Closing Time

In general mobility scooter and wheelchair users commented that the gates that closed in about 5.0 seconds or less closed too quickly and they did not have enough time to get through the gate, but they had enough time to get through the gates that closed in 7.0 seconds or more.

Width

There were very few comments about the width of the gates made by these users. There were six comments about the width of Gates 2 and 3 (1.73m) as both being 'a good width' but these were not repeated consistently for the other gates that were wider than the statutory minimum. It is possible to conclude that gate width is not an important factor of bridle gate design for these users.

Other Criteria

Many users commented that the wire mesh on the bottom of the gates was not helpful as it tended to catch on chairs and scooters. Users suggested that a thin smooth plate, on both sides of the gate, at the height of the foremost projection on both chairs and mobility scooters would be very helpful to them being better able to use gates by pushing them open. This plate does not need to be the full width of the gate but only where users would push against the gate, the increased wind resistance will need to be considered by the gate manufacturers.

Conclusions relating to mobility scooter and wheelchair users

The trial demonstrated that the least restrictive and safest gate for mobility scooter and wheelchair users is a 2 way opening non-self-closing gate.

However, the safest self-closing gate would have the following characteristics:

- 2 way opening
- Force required to open the gate less than 40N and probably about 20N, less force is better
- Closing time of 7 seconds minimum
- Character of the gate closing the same as experienced with the hinge in Gate 6
- Statutory minimum width for a bridle gate is satisfactory
- A push plate at the height of the front bumper or foot rest

Further investigation is required to determine:

- a) The best positioning of the mobility scooter or wheelchair to make it easiest to reach the handle or latch: it may be possible that a position of 'heels to hinge' may make it easier for mobility scooter and wheelchair users as it does for horse riders;
- b) The design of both handles and latches at the appropriate height for mobility scooter and wheelchair users so that they are easier to manipulate from both sides of the gate;
- c) The design and positioning of any colouring, marking and instructions for users;
- d) An appropriate material to use for any colouring or marking so that it is weather resistant and will not fade; and,
- e) The design of any aids that makes it easier for users to open gates.

8.5 Farmers' analysis

As mentioned in the methodology there were too few participants who self-identified as farmers for the results to be indicative of land holders in general. These participants completed the trial as a group rather than individually, which was the trial protocol. Unfortunately timings were such that they did not see any horse riders complete the trial.

The seven farmers who participated in the trial had a clear preference for Gate 4, with Gate 1 and Gate 8 receiving some positive comments. The other gates were only acceptable for installation by a small minority of participants. As might be expected, the majority of the farmers' comments about the features of the gates, handles and latches were about their perceived stock proofness, but there were many aspects to this which will be explored individually. It is this analysis which enables us to identify the features that farmers value.

Farmers have a requirement for gates to be stock proof, not only to prevent livestock from leaving their holding and possibly causing an accident, but also to keep livestock safely in the right field. Livestock that escape from their field may be exposed to additional hazards such as steep drops or slurry pits which have the potential to cause serious injury to the animal or even death. Escaped livestock may mix with others and not only can it be very time consuming to separate livestock again, but mixing livestock at the wrong time can have more long term impacts for the animals concerned including injury or unwanted mating.

Self-Closing or Non-Self –Closing

Many comments were about gates needing to be closed by users with several comments about not trusting users to close gates. From this it would be expected that the non-self-closing gate would be the least favourite of all the gates, however one of the two second favourite gates that farmers said they would install on their land was the non-self-closing gate (No 1). There is no obvious explanation for this contradictory finding, however it may be that the farmers who participated in the trial would consider using this gate where there is no absolute requirement to contain stock.

Gate closing times, hydraulic and offset hinges

Recordings were made of the actual closing times for all the gates to close from their maximum opening position and the times taken for all the gates to close after the

participants to pass through (Table 13). As gate 1 was not self-closing it was not included in this part of the trial.

Table 13: Gate closing times for farmers passage through gate

Gate Number	Pre-set closing time from maximum opening width (seconds)	Closing time on clearance ¹ (seconds)	
		Minimum	Maximum
2	7.5	2	5
3	7	2	4
4	7	1	3
5	5	2	4
6	8	2	3
7	3.5	1	2
8	5	1	2
9	4	1	2
10	5.5	1	2

¹Recordings were made of the actual closing times for all the gates to close from their maximum opening position and the times taken for all the gates to close after the participants had passed through (Table 13). As gate 1 was not self-closing it was not included in this part of the trial.

'Prosafe' self-closing hydraulic hinges were fitted on gates 2,3,4 and 6 and all set to close between 7-8 seconds from fully open. Seven participants commented that Gate 2 closed too slowly even though it usually closed within 2 seconds. Two farmers commented that Gate 3 closed too slowly however the closing times were usually 2 to 3 seconds, and on one occasion 4 seconds. Two comments were made about the closing time of Gate 6 being too slow, but the longest time for this gate to close after any of the farmers had cleared was 3 seconds. Gate 4 also took 3 seconds to close after the farmers, but in contrast no comments were made about it closing too slowly. Neither were any comments made in regard to Gate 4 about the risk of cattle following users, or the risk that the gate might not latch after use.

Gate 5 had a rising self-closing pivot hinge and was pre-set to close from its maximum opening width within 5 seconds

Gates 7, 8, 9 and 10 all had offset hinges and closing times from maximum opening from 3.5 seconds to a maximum of 5.5 seconds. Only Gate 8 attracted comments about its closing time with two of the farmers saying it was too slow, even though it's maximum recorded time on clearance was 2 seconds, which was the same as for Gates 7, 9 and 10 and faster than any of the gates with self-closing hydraulic hinges.

From the results obtained, and the small number of farmers who participated in the trial, it is not possible to discern whether closing time was a major concern for farmers. It appears that farmers' perceptions of other factors about the gate, handle and latch impacts upon their assessment of the acceptability of the closing time of a gate.

One-way or two-way

The farmers' favourite, Gate 4, was a 2 way opening gate. Whilst several comments were made about the use of one way gates so as they open into the livestock field (i.e. shut against the post from the direction of the livestock) there were also comments about stock being able to open these one way gates from both sides.

Handles

The farmers' favourite Gate 4, was fitted with a stock proof handle which the user is required to lift before being able to move the handle sideways to open the latch. For all other gates farmers commented that cattle would be able to open the gate, either by rubbing their necks/heads against the handle and therefore being able to move the handle sideways, or in the case of the top ring handles it was commented that the cattle would either push the ring up or down, thereby opening the gates. Manufacturers wishing to further investigate the use of this handle should consider this potential issue.

There were only two comments in relation to other stock, sheep, and it was stated that sheep might rub against the bottom of the handles on gates 9 and 10 and thereby open these gates.

It is therefore possible to conclude that on farms where there are cattle and there are concerns about them encountering hazards should they exit through the gate it would be appropriate to use some sort of stock proof handle, or one that does not protrude above the top of the gate. On farms where there are sheep but no cattle it would be possible to use handles which protrude above the top of the gate, but double trombone handles (as were fitted to gates 9 and 10) are not advisable.

Latches

There were relatively few comments from the farmers about the latches used on any of the gates other than that they perceived that a few presented possible finger traps, and the latch on Gate 5 was not stock proof. There were a very small number of comments about the height of the latch being a hazard, it was commented that the latches were at knee height. No walkers made the same comment, nor did any walker in the trial have any problems, but it might be important to explain to farmers why a lower latch is both safe and better for a wider range of users.

Ease of Use

Farmers found that most of the gates were easy to use, with only a very few of them needing two attempts at gates five and six which both had overhead ring handles. No instructions were given to the farmers about how these gates operated so for most farmers this would have been their first encounter with such a mechanism. When the farmers commented upon ease of use there was no preference for non-self-closing gates or self-closing gates.

Robustness

There were only a few comments about the robustness of the gates and none about maintenance. There were comments about Gate 5 and 6 requiring concrete and how this is not suitable for a rural area. However, it should be noted that all the gate posts in the trial were concreted in, with many of the metal gates being on H frames to prevent movement of the posts during their lifetime. There was also one comment about the long term robustness about the closing mechanisms on gates 5 and 6. There were several comments about the fragility of gates 9 and 10, which seems to indicate that wider wooden gates are not perceived to be sufficiently robust, but these comments could have equally been about the handles.

Conclusions relating to farmers use and views on the gates

- The evidence from farmers who took part in the trial indicates they had a strong preference for a stock proof handle on gates where cattle are present. The trial did not test the gates with sheep present. There appeared to be no preference for one-way gates over two-way and no preference for any particular type of hinge. No conclusions could be drawn about preferred closing times from the limited data available.
- The results showed that farmers have a perception of what they think the walkers and horse riders might think and also how aspects of the gates might be a hazard to these users, however the farmers in the trial did not mention how the gate, handle or latch designs might impact upon someone with a disability or cyclists.
- When marketing gates to landowners it may be helpful for manufacturers to use the results of this trial to reassure landowners about features of gates which they might perceive to be hazards but are actually features which improve the users experience. Manufacturers may also find it useful to point to features that enhance the stock proofness of a gate design.

9.0 Lesson learnt regarding installation of gates

- a) Gates posts need to be installed so that the uprights of the gate are vertical and the rails are horizontal. This is important for all gates but especially important for self-closing gates where the efficacy of the self-closing mechanism can be affected by being out of true.
- b) Gate posts should not be used as straining posts for the adjoining fence as this would pull them out of line over time.

- c) All components of the gate posts and rails should be inspected to remove any sharp edges. This includes tops and the edges of the gate posts, protruding bolts, and all elements of the latching and hanging mechanism.
- d) The manoeuvring space should be on even solid ground, have no overhead or trip hazards, no ditches, holes, steps or deep mud and no signs or notices intruding into the space where the horse's head needs to go for heels to hinges operation.
- e) Gates that are noisy can cause horses to be alarmed making it more difficult for the rider to control their mounts. Where a gate is noisy, it should be modified so that the noise is dampened.
- f) Gates should be regularly inspected and maintained, as wear, tear and weather can affect both the mechanisms and the ground.

10.0 Discussion of findings and the implications

The trial was established to identify those critical features of gates that make them more or less suitable for land managers and the full range of users. Some of the findings will also inform the design, installation and maintenance of pedestrian gates particularly with respect to their use by people with mobility scooters and wheelchairs. We acknowledge that the gates being trialled were at their lifetime optimum and there will be a degree of deterioration observed from their performance as seen at the trial.

The landowner is responsible for most gates used for public access on public rights of way and on common land. Landowners have to balance two requirements: the necessity to contain livestock and the need to provide safe passage for the user. Guidance on the law and regulations that relate to gates are summarised in Appendix 11.

The consequences of livestock straying can be considerable. The lowest impact upon the livestock owner from stock straying would be the time to collect livestock from a neighbouring field and move them back to where they should be; this can also have an effect on health and safety and animal welfare. The severest impact of straying livestock is that they can wander onto roads where there is the potential for them to cause a road traffic accident and possibly death. Landowners also have to consider how a gate impacts upon users. A dangerous gate may cause injury to users who may then sue the landowner. Following an accident a landowner may also be investigated and possibly prosecuted by the Health and Safety Executive who will assess if the gate design is safe and if the gate has been installed correctly and maintained.

Of course no gate, or fence at the normal height of a fence, is totally stock proof. Cattle, sheep, goats and horses will jump or push through fences if they are sufficiently motivated either through fear or a desire to join other stock or reach better food. However gates have the potential to allow stock to escape in a number of additional situations:

- When gates can be opened by stock;
- When livestock exit the gate whilst it is in use by others (tailgating); and
- When gates are not closed after use.

The conclusion from the trial was that the overriding criteria for farmers was that the gate should be stock proof when closed and that stock should not be able to open the gate. For

all but the busiest sites this is rational as livestock are contained within enclosures all day and night, often over a period of many months, but the gate may only be used a few times in a day, therefore the highest probability of stock escaping is not when human users are present but when they are not.

This trial was the first ever trial of the stock proofness of any design of gate. The only gate that was opened by the cattle was the wooden non-self-closing gate, none of the self-closing gates were opened by the stock. The gate that was opened by the cattle was one of three wooden gates in the trial but we do not know if this was a factor. Cattle sometimes rub against rough surfaces and, because of this, wooden gates may be more likely to be opened by cattle than metal gates. This trial was not designed to find out if wooden or metal gates are more prone to being opened by cattle, as this would require a longer term study to thoroughly investigate.

To prevent cattle from opening a gate the farmer participants in the trial preferred the stock proof handle for use when cattle are present. Where cattle are never present there is no requirement for stock proof handles as ordinary handles cannot be opened by sheep. However the stock proof handle used in the trial was a problem for some disabled users and some horse riders. It was concluded that it may be possible to make the stock proof handle easier for horse riders to use if it were positioned at an angle with the handle leaning towards the slam post, but this would benefit from some further investigation. Adjustments to make the stock proof handle easier to use for disabled people, particularly those who use wheel chairs and mobility scooters will also need further investigation.

The farmers who participated did not express consistent views on the closing speed of gates and the potential for livestock to exit a gate whilst it was in use (tailgating), although this is a concern that has been expressed by other farmers. In practice, the circumstances in which livestock may escape through the gate whilst it is in use by the public need to be considered, as well as the design of gates.

Some livestock, particularly cattle, become curious about people in their field and like to get close to, and follow, people. A gate that has been designed to be easy for all users to use is also a gate that users can get through quickly with the minimum of effort. An easy to use gate will therefore reduce the time taken for any user to open and use the gate, and providing the gate is not left wide open, cattle are therefore less likely to escape if a gate is easy to use for the public. Whilst livestock owners may be inclined to install a gate that closes very quickly it should be noted that in the trial, the gate that closed very quickly hit users more frequently, and some users had to have many attempts to get through this gate. During the trial it was observed that in use a very fast closing gate can take users longer to get through than one that closes at a safer speed. We therefore suggest that landowners should install gates that have characteristics that make them easy for the public to use, including a reasonable closing speed, in preference to gates that are problematic for users by closing too quickly.

In practice livestock owners can also reduce the probability of livestock escaping through public access gates by adopting some husbandry practices. Livestock generally gather in places where there is food, water or shelter and around the access points that are used by stock keepers who bring food. Positioning these 'draw' factors away from gates used by the

public, and not on the line of a public path and not using public access gates to bring food to livestock is likely to reduce the number of interactions close to gates between the public and livestock and the probability that livestock will attempt to exit the gate whilst it is in use by the public.

A great many livestock owners prefer self-closing gates because their installation reduces the probability that a gate will be left open by a member of the public. The Countryside Code states that users should “leave gates as you find them” but this advice may not be helpful in all circumstances. With large groups using a trail the first walker, cyclist or rider may open the gate, but the last one will not know if the gate should be left open or closed, so a sign is always helpful. Signs could state

“This is a self-closing gate, but please ensure this gate is closed after use”

Or

“Please close this gate”

If gates are not required to be closed it is helpful to users if landowners tie or lock them open and remove or cover any signs about closing the gate. Landowners may wish to keep gates closed where they consider that an extra barrier between a livestock field and a potential hazard is required, but tying or locking gates open when they are not required to be closed to secure livestock will reduce wear and tear on the gate, reducing both the long term maintenance costs and the compaction and disturbance of the surface around the gate. Users can pass straight through open gates, rather than having to manoeuvre around the gate which also reduces the probability of an accident occurring.

The trial invited users from a wide range of user groups: walkers, cyclists, mobility scooter and wheelchair users and people with other disabilities and horse riders. The working group recognised that gates that might meet the needs of some groups may not be useable for others. It is frequently reported by the Disabled Ramblers that it is not the natural features of the terrain that stops disabled people, but often the man-made barriers which have not been designed to accommodate the needs of the disabled. To test the suitability of the gates we set out to have a higher proportion of users declaring a disability in the trial than the proportion of disabled people who visit the natural environment as measured by MENE. The proportion of disabled riders was similar to that within MENE.

The trial user participants were mainly self-selected volunteers, the majority of whom were from the local region, except some of the horse riders who were students at Askham Bryan College who were asked to participate during their practical riding session by their lecturers. Some participants had greater experience of using gates than others, and some voiced opinions about the suitability of some of the gates before they actually used them. After using the gates sometimes participants revised their assessment of some of the gates, but others did not. The method of analysis was designed so that it was possible to analyse the actual passage of participants through the gates using the video recordings as well as documenting people’s opinions of the gates.

Interestingly the different groups of participants had very differing expectations of a “good gate”. All of the able-bodied adult walkers were able to use all of the gates, and none of

them were hit by a gate, nor did they experience any significant delay in working out how to use any of the handles, and in general the comments reflected this. A few users pointed out “hazards” that, in the trial, had no detrimental impacts.

The participants who had a physical disability were, on the whole, very pleased to have the opportunity to try all the different designs, many showing great determination to get through. This group was less concerned about hazards, but more concerned as to whether it was possible to open a gate and pass through it at all.

The cyclists who regularly cycle off road commented that generally all the gates were fine, but they very much appreciate it when gates are tied open if they are not needed. One participant commented that they thought it would help relations between farmers and cyclists because on a 15km ride there might be 30 gates, and slowing down and getting on and off for 30 gates became very tedious, especially where there were no livestock in the field. This participant thought that cyclists would be more careful about closing gates if they only had to close those that were necessary. Some horse riders also commented that it was helpful if gates were tied open when they were not needed to be closed to contain livestock.

The two groups of users who experienced most problems with the gates were the horse riders and the mobility scooter and wheelchair users. Overwhelmingly the safest and easiest gate for all users was the 2 way non-self-closing gate. This gate did not hit any user. Where a gate is necessary this is the least restrictive option and in some places it will be suitable for use where landowners are confident that users will close the gate, especially if a suitable sign is attached.

Where a self-closing gate is required two issues arise: firstly there is a greater risk of the gate hitting a horse or rider and secondly disabled users may not be able to open the gate and pass through it. It is important that disabled users’ needs are addressed as potentially if they are unable to open a gate they may not be able to go forward or to backtrack therefore becoming stranded in a field. Every time a gate hits a horse or rider there is the potential for damaging consequences (see Appendix1). Even though each individual hit may not cause obvious damage or a serious accident the cumulative effect of gates hitting horses may make them unwilling to pass through gates and therefore more difficult to control, which then increases the probability of an accident.

To reduce the risk of a self-closing gate hitting a horse or rider we concluded from the trial that the safest method for riders to use the gate is the BHS recommended method of “heels to hinges” and push. When horse riders pull gates towards themselves the hit rate trebles compared to pushing a gate. This has implications for the selection of an appropriate gate by landowners: a 2 way gate is safer than a one way gate. We also note that because there is a much greater risk of a self-closing gate hitting a horse or rider compared to a non-self-closing gate there is also a greater risk of wounding from any latches and catches. In particular we are concerned that there is a risk of severe puncture wounds (as have been reported). We therefore recommend that gate latches use a D shaped latching mechanism rather than a simple bolt.

Many mobility scooter and wheelchair users also preferred to push gates open, self-closing gates that had to be pulled open could not be opened at all by several of these users. This

means that, where the Equality Act 2010 applies, self-closing gates should be 2 way opening or an alternative should be provided.

The other factor which affected rider safety most significantly was the time it took for the gate to close which relates to the speed of closure. The self-closing gate in the trial that had no dampening mechanism bounced on the hinge and had a higher hit rate than any other gate in the trial (about 20% of gate passages). As mentioned previously, landowners may be inclined to select a gate which closes very quickly, but this is not likely to comply with the requirement to provide safe passage for users. From the observations at the trial the safest passage for users was when they could easily open a gate fully and then the gate remained open sufficiently long enough for the rider to pass through without having to take their hands off the reins to push the gate again. There was no single gate in the trial that had this characteristic, however it could be achieved by designing a gate which required a force of no more than 18 Newtons to open it, a closing time of 8 seconds and a delayed action hinge which keeps the gate open at or near its fullest extent for about 2 seconds before closing more rapidly. Where a gate is designed so that it cannot bounce on its hinges and return closed too quickly any reduction of force below 18N is a benefit to all users.

Riders commented that they preferred a gate of about 1.7m to the standard width of 1.52m so an ideal gate would also be wider than the standard. However this factor did not appear to affect safety and ease of use as much as the other factors of closing speed and the force required to open a gate. Clearly there is a relationship between the width of a gate, its weight and the force required to open it, so while a 1.7m width gate may be desirable it may be difficult to achieve this as well as the other more critical design features.

There was insufficient data from the trial to be able to state with certainty whether pushing a gate is safer because the method is safer or because it is the method used by the more skilled riders. During the trial we explored the use of a training video to see if this had any impact upon the riders ability to use gates. The numbers in this part of the trial were small, but it appeared that riders who viewed the video and who then used the method demonstrated, were able to use all the gates more easily and quickly. We therefore recommend that any rider wanting to improve their safe use of gates should view the video on the BHS website.

Before conducting the trial we asked for people to recommend gates and features of gates that they thought should be trialled. One feature that we did not trial, as it was not suggested during the developmental stage of the trial, was a shorter handle i.e. a handle no higher than the top rail of the gate. This handle, it is argued, does not need to have a stock proof mechanism since it is less likely that cattle will push the handle sideways and a shorter handle is less likely to become entangled with the bridle or martingale. The issue with shorter handles is that they are difficult to reach for some riders and there is nothing above the height of the top rail for the rider to push or hold to open the gate and control it as they pass through. Without a livestock trial it is not possible to ascertain whether lower handles are more stock proof than handles that protrude above the height of the gate however the trial and subsequent investigation provide data from which it is possible to assess the other aspects of shorter vs. longer handles.

During the trial the rate of entanglement we observed was less than one in one hundred, However the rate of comments voicing concern about entanglement was one in ten which is much higher than the actual rate of entanglement of one in one hundred. It should be noted that the BHS recommend the 'heels to hinges' method 'because it substantially reduces the chance of the reins, bridle or martingale becoming caught up on the gate or its handle or of the horse being hit on the underside of its jaw by the gate or handle'³⁰. Given the very small number of entanglements we observed it was not possible to determine whether the rider's approach contributed to an entanglement. However in comparison the number of times the gates hit horses or riders was higher than the rate of entanglement so we judge that the greater improvement to safety would be from riders being able to better avoid being hit than from avoiding entanglement.

The issue with handles that are below the top rail of the gate is that some riders will find them difficult to reach and become unbalanced; this increases the risk of an accident and the probability that it will cause injury to the rider by falling off should an accident occur. In the trial a rider of 173cm (5'8") on a horse of 168cm (16.2hh) had to stretch to reach the handles of the majority of the gates trialled (see Photograph 1).



Photograph1: showing the rider stretching to reach the bridlegate handle in the heels to hinge position.

A short rider of 150cm (4ft 11inches) on a tall 180cm (17.3hh) horse becomes unbalanced if attempting to reach below 1.50m. (per obs.). Even at full stretch and unbalanced a short rider on a tall horse can only reach down to 1.30m. (per. obs.). The handle that protrudes above the top of a gate (at about 1.40m) will still be a stretch for a short rider on a tall horse, but one which is possible. The high handle is also within the reach of a short person on a

³⁰ BHS undated "Advice on Gaps, Gates and Scooter Barriers" published by BHS, Kenilworth

pony: a rider 150cm tall on a 109cm (10.3hh) pony can reach a handle at 1.60m. In comparison the height of the top rail of most gates is about 1.20m, and the height of a short handle will be lower. Riders using gates with short handles will have to reach below 1.20m to use the handle. The data above shows that for many this would leave them unbalanced and for some it would be impossible. The trial also investigated the use of high “ring handles” on the Portail Equestre (Gate 5) and the Alton (Gate 6). The video evidence showed that with both of these gates riders remained in an almost upright position (see photograph 2).



Photograph 2: showing the rider passing through the Alton Gate with a ring handle continuing from the heels to hinge position.

Riders were able to control these gates more easily whilst they were passing through the gate opening. Although the farmers in the trial were concerned about the stock proofness of the ring handle, in situations where there are no cattle but a high level of horse use this type of handle may be particularly useful, providing a lower latch is attached for other users and the gate requires no more than 18N to open.

Within the trial the gates were spaced so that there was the required clearance around every gate with a relatively flat surface, no protruding signage and no overhanging vegetation in line with British Standard 5709. The BHS advice on gaps gates and scooter barriers recommends a clear manoeuvring space of 4m wide by 4m long, with a minimum of additional 4m length of waiting space if use by groups of horses is likely. We recommend that BHS reviews the recommended manoeuvring space and its location: this should be possible through further review of the video evidence from the trial.

During the trial it was observed that the ‘heels to hinges’ method was the safest approach to opening a bridlegate. This requires the rider to not ride directly straight towards the gate but to ride their horse so that they are positioned parallel to the gate, so that the rider can reach the handle, usually by leaning forwards. If sufficient safe manoeuvring space is not provided then the rider has to adopt the head on approach to open the gate head on and this will compromise safety. In the trial we observed that for riders that adopt a head on approach the

hit rate doubles from about 3% of gate passages for heel to hinge to about 6% of gate passages for head on.

The provision of safe manoeuvring space is important for safety, and on public rights of way it is a matter which needs to be considered jointly by the landowner and the local highway authority. Observations over many years indicate that there is little provision of safe space around obstacles, frequently the manoeuvring space on both sides of gates is obstructed by signs, vegetation, and other obstructions. It is probable that a significant reduction in the hit rate of gates on horses and riders could be achieved by the relatively simple process of clearing spaces around gates, removing man-made obstructions and ensuring that new obstructions are not created however we recognise that improving the manoeuvring space may not be possible in all current situations due to the physical location of the right of way and ditches, hedges and other features and moving gates can be complicated by legal considerations.

Within the trial we used an experienced fence and gate contractor and supplied them with relevant extracts from the British Standard, even with this level of expertise there were some adjustments that had to be made to the gates and the gate posts before the trial could be commenced.

From observations of gates in the wider countryside it is clear that the British Standard is very rarely adhered to in full. This has the potential to compromise the safety and enjoyment of users, and in some cases, particularly the disabled, will prevent them from accessing some places. The lack of understanding of the standards of access furniture should be addressed, with Natural England, user groups and landowner representatives working together to spread information about the standard.

In the trial we measured the performance of the gates over a short period and although the gates were used frequently within this time we recognise that we were unable to fully explore the robustness of all the gate features. Most of the features we trialled are features that are already in production and use though not necessarily on bridle gates, we therefore conclude that gate manufacturers are best placed to advise on the robustness of any features and their suitability. We would welcome further research into the robustness of gates over a much longer timescale.

Overall we hope that this report and its findings will be useful to gate manufacturers, landowners, gate installers, highway authorities, users and user groups, though we expect that many will just read the summary. We think that this research will give gate manufacturers in particular an insight into what particular users require which will help them in their product development and marketing. We also recommend that highway authorities consider this evidence when specifying structures that can be installed on public rights of way in the future, in particular when authorising new structures under the Highways Act 1980 s147.

To conclude, the owner of any gate needs the gate to perform two functions, retaining livestock and allowing safe passage of users. The trial concluded that the safest gate for all users is a 2 way opening non-self-closing gate, however if a self-closing gate is required then it should be 2 way opening, require a force of no more than 18 Newtons to push open,

have a closing time of 8 seconds and have a delayed action on the hinge to prevent the gate slamming back into the user, and have a D shaped latching mechanism . For safe use, users need to be able to manoeuvre and this requires an adequate safe space clear of obstacles.

It is suggested that the committee revising BS 5709 reviews the analysis and the findings and incorporates appropriate changes into the standard so that gate manufacturers, installers and landowners can be reassured that what they install in the future is to a safe standard. In the short term others can act on the findings of this trial to make existing gates safer and easier to use, for example the provision of a safe manoeuvring space clear of obstructions which in some cases does not require any capital expenditure and could be carried out in a few hours.

11.0 Final Conclusions

We conclude that the safest bridlegate for all users is a 2 way opening non-self-closing gate however we note that this gate will not provide the stock proofness that many farmers require from their gates.

To improve the stock proofness of a gate farmers require a gate that is self-closing and which cannot be opened by stock. Where only sheep are present there is no requirement for a stock proof handle however gates will require wire netting so that lambs cannot escape. Where cattle are present farmers require a stock proof handle to prevent stock from opening the gate. The current stock proof handle that was tested in the trial was difficult for some users so we recommend that further thought is given to how handles may be made so that they are easier for users whilst remaining stock proof.

The safest method for horse riders to use a gate that we observed in the trial was for the rider to position the horse “heels to hinge” and push the gate open. We strongly recommend that riders are encouraged to learn this method, although we also recognise that it may not be suitable for some horses or riders and in some situations with existing gates.

As the safest method to open a gate is for a rider to go “heels to hinge” and push this leads to the conclusion that self-closing gates should also be 2 way opening and adequate manoeuvring space should be provided. We recommend that the BHS review the dimensions of a safe manoeuvring space. We also recommend that highway authorities and landowners consider how they can provide safe manoeuvring space around current structures.

For safe use by horse riders and mobility scooter and wheelchair users and for farming purposes self-closing gates should also have the following features:

- 2 way opening
- Force required to open the gate of no more than 18 Newtons (and preferably less)
- Closing time of 8 seconds
- Character of the gate closing the same as experienced with the delayed Prosafe 2 way hydraulic hinge in Gate 6
- A push plate at the height of the front bumper or foot rest
- A handle angled towards the slam post
- A “D loop” latch
- A stock proof handle may be used where cattle are present

For additional ease of use and safety, manufacturers may wish to consider how they could design bridle gates that also have these features:

- Width of 1.7metres
- A handle that facilitates control as demonstrated by the ring handle

We hope that this report will, alongside other legal and practical requirements for landowners, be taken into consideration during the next review of BS 5709 gaps, gates and stiles, and also when Highway Authorities are authorising new structures on public rights of way.

Additional research about suitable gates for use on footpaths so that they meet the needs of disabled people would be appropriate. The findings from this trial indicate that gates, if self-closing, should be 2 way opening with push plates.

It would be helpful if gate manufacturers could investigate how they could support gate installers so that they are better able to install gates so that they comply with the manufacturers' guidance and the British Standard.

Appendices

Appendix 1:

Photograph of horse injured by a self-closing gate



Photograph provided by Bob Milton who was sent this from a rider in Sussex.

This horse was injured when a wooden self-closing gate slammed shut on the horse's side.

Appendix 2:

Key Findings and recommendations from *A trial of self-closing bridle gates and a horse-friendly vehicle barrier* by The British Horse Society 2011

1. Self-closing bridle gates are neither as safe nor as easy to use for horse riders as British standard 5709:2006 compliant non-self-closing bridle gates and they exclude some horse riders. Following the principle of the least restrictive option, self-closing bridle gates should not be used routinely on public rights of way or other land with equestrian access.
2. The trial showed that there was considerable variation in the performance of commonly available self-closing gates with respect to their reliability to self-close, their safety for horse and rider and ease of use by riders.
3. The Centrewire 'Worcester' hydraulic one-way gate (Gate 5) was the best of the gates trialled when set to its maximum closing speed of 26 seconds. However, there were still some problems for riders with this gate.
4. The Centrewire 'Chiltern' two-way self-closing gate (Gate 6) as supplied is not recommended for use. In the interests of rider safety, it is recommended that it should be discontinued promptly.
5. None of the other self-closing gates tested (Centrewire 'Henley' one- and two-way self-closing gates, Centrewire Chiltern one-way self-closing gate and unbranded one-way gate with D ring and autolatch with extended handle) can be recommended in preference to non-self-closing gates installed to meet British Standard 5709:2006 as none of them performed reliably well for both riders and/or landowners.
6. Stock proof handles increase the difficulty of use. Following the principle of least restrictive option, these handles should not be installed except where it can be proved that they are needed and that the need outweighs the potential damage to horse and rider.
7. Further research is required to try to:
 - establish an optimum overall closing speed, and the best balance between the controlling screws' closing speed, for the Centrewire 'Worcester' hydraulic one-way gate (Gate 5) which will allow safe and easy passage for riders and their horses but ensure that livestock cannot escape test the Centrewire 'Worcester' hydraulic two-way bridle gate establish whether self-closing bridle gates perform better if they were widened to provide more than 1.52 metres clear width when fully open
 - Establish whether the comparative results between the Centrewire gates in this trial would be substantially different if all or none of the handles were stock proof.
 - Test the gates with users with a full range of disabilities who access the countryside and rights of way in compliance with the Equality Act 2010.
8. Pending this further research, if installation of a self-closing gate is essential, without prejudice or liability the BHS found that the best of the existing self-closing bridle gates trialled is the 'Worcester' hydraulic gate, correctly installed as per the BHS construction leaflet and BS 5709:2006, set to close in approximately 26 seconds. Mounting blocks should be constructed on both sides of the gateway if the local authority's equality impact assessment concludes that they are to be provided.
9. Because of the problems associated with the majority of self-closing gates in this trial, it is very strongly recommended that any self-closing bridle gates which have been installed in conditions which do not provide clear manoeuvring space to the British Standard (including

those which self-close only through non-purpose-made offset hinges) should either be repositioned so that they fully meet the requirements for manoeuvring space and adjusted to close as slowly as possible, or else be replaced by well-balanced non-self-closing gates.

10. British Standard 5709:2006 requires revision in respect of self-closing bridle gates.

Appendix: 3

Definitions of terminology set out in the objectives

- Ease of use: That the gates should be opened without difficulty or struggle by a range of users including horse riders, users of mobility vehicles, older and weaker users, cyclists, and by the visually impaired.
 - It is acknowledged that a degree of familiarisation may be required with new mechanisms by certain groups of users.
- Safe use: That the users are able to pass through the gate without the gate impeding their passage by closing too quickly and without any part of the structure causing a danger to the users and their horses.
 - This may involve testing a range of closing speeds for each of the gates and must not affect the gate remaining stock proof – see below .
- Stock Proof: So that when the gate is closed the mechanisms are such that they cannot be opened by livestock such as cattle, horses and sheep. Further that the gate closes and fastens after the user has passed through in such a manner that stock is unable to follow.
- Robust: That the gate is of sufficient quality and resilience that a period of normal use does not result in a loss of the above qualities, namely, ease of use, safe use and stock proof-ness. In addition, when installed according to instructions the gates will fulfil these criteria and will not require further adjustment during the period of the trial

Appendix 4:

Standard operating procedures for

- Gate Installers : Appendix 4a
- Stockmen: Appendix 4b
- Trial managers: Appendix 4c

Appendix 4a:

Guidance for Gate installation given to gate installers

Background

In recent years, self -closing bridle gates have become increasingly popular with both private and public landowners to avoid the possibility of gates been left open. However, it became evident with usage that there is dissatisfaction with the performance of the gates and the BHS was alerted to a number of reports of accidents and near accidents. The result has been both physical injury to horse and or rider and fear of using such gates that ultimately affects the desire and ability of horse riders to access areas of the countryside.

In order to address this issue in 2011 the BHS trialled six self- closing gates to assess their reliability and ease of use. The results of the trial were published in “*A trial of self-closing bridle gates and a horse-friendly vehicle barrier by The British Horse Society 2011*”. The trial produced some interesting findings; these have informed our thinking regarding the gates to be tested and the methodology we are using in the present trial

Following on from the report Natural England and The British Horse Society (BHS) have been working in partnership towards a second trial. The Trial Working Group has agreed the following objectives.

- 1) To determine whether the self-closing bridle gates can be used safely and easily by a range of users, whilst closing within a time frame to prevent escape of livestock.
- 2) To determine whether the self-closing bridle gates remain adequately stock proof when they are closed.
- 3) To determine whether the gates are both of a robust nature and easy to install by an experienced installation professional.

See Exhibit 1 for definitions

In 2015 we will be trialling a number of gates (see Table 1); these have been chosen and developed to address the issues raised in the 2011 trial, for the See Exhibit 1 for full specification

Table 1:

Brief description of gates included in the trial

Gate Number	Name	Width (metres)	Supplied by
1	CONTROL GATE Two-way non self-closing wooden gate with latch	1.63	Centrewire
2	Original Worcester:	1.52	Centrewire
3	Modified Worcester MK1	1.73	Centrewire
4	Modified Worcester MK2	1.73	Centrewire
5	Portail Equestre	1.50	Constructeur Metallique
6	Alton Gate	1.73	Centrewire
7	Metal 1 Way self - closing gate – offset hinge.	1.50	Centrewire
8	Compton 2 way self-closing hinge	1.63	Secure – a – field:
9	Timber one way self-closing with offset hinges	1.63	Centrewire
10	Timber one way self-closing with offset hinges	2.11	Centrewire

Exhibit 1

Specification of Gates

Gate 1: Control Gate

Description: A wooden gate with an opening of 1.63m. It is a non –self closing gate. It is two way opening and is fitted with two way gate catch and a bridle latch handle.

Additional Information: This has been included in the trial as a control gate to the self-closing gates being trialled.



Technical drawing:

Non available

Gate 2: Worcester 2 Way Gate

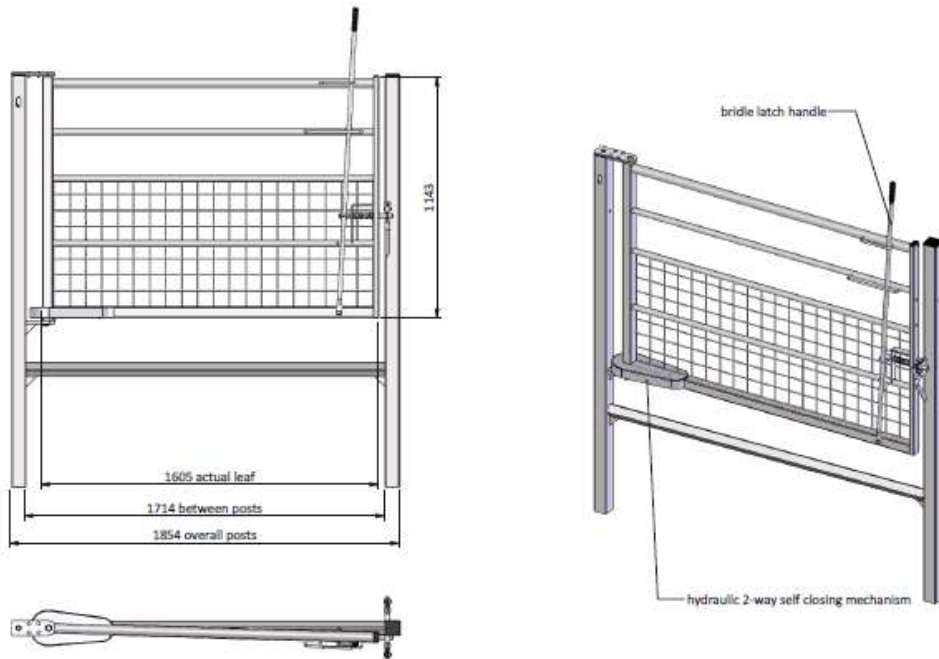
Description: A metal H frame gate wooden gate with a standard opening of 1.52m. It is a self-closing gate. It is two way opening with a Prosafe self-closing 2 Way hydraulic hinge system. It is fitted with an in line 2 way gate catch and a bridle latch handle.



Additional Information

The gate was included in the 2011 BHS trials and was the only gate to find favour with the riders who took part in the trials. The gate was set to self-close 25 seconds either way.



Technical Drawing



 Mossfield Road, Addeney Green, Longton, Stoke-on-Trent, Staffs. ST3 5BW TEL: 01782 339348 FAX: 01782 339349 email: sales@centrewire.com web: www.centrewire.com	TITLE	SCALE	NTS	A4	
	WORCESTER 2 WAY HYDRAULIC SELF CLOSING GATE	ORDER No.	DRAWN	DATE	
	CLIENT	-	PED	09/03/2015	DRG No. F010 2008 01-01

Gate 3: Worcester 2 Way Gate MK1

Description: A metal H frame gate with a wider opening of 1.73m. It is a self-closing gate. It has a two way opening with a Prosafe self-closing 2 Way hydraulic hinge system. It is fitted with a two way autolatch and gate catch and a bridle latch handle.

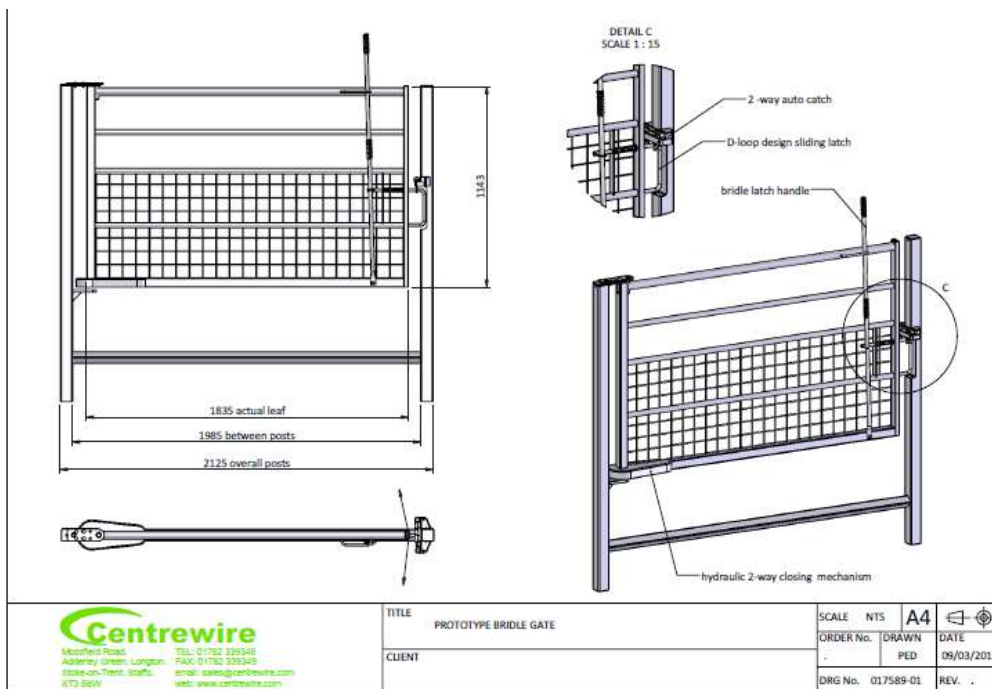
Additional Information

The gate has been redesigned to take account of the outcomes of a meeting with BHS / Natural England/ BS5709 working party and the 2011 report. It has been labelled the MK1 revised Worcester Gate. The new features are:



- A wider gate leaf resulting in the wider opening of 1.73m, to test whether the gate is easier and safer to pass through.
- A retractable D latch catch in place of a shoot bolt to see whether this reduces the fear and reality of horses and riders being caught.
- A 2 way catch to test whether it is more user friendly for users of mobility vehicles.

Technical Drawing



Gate 4: Worcester 2 Way Gate MK2

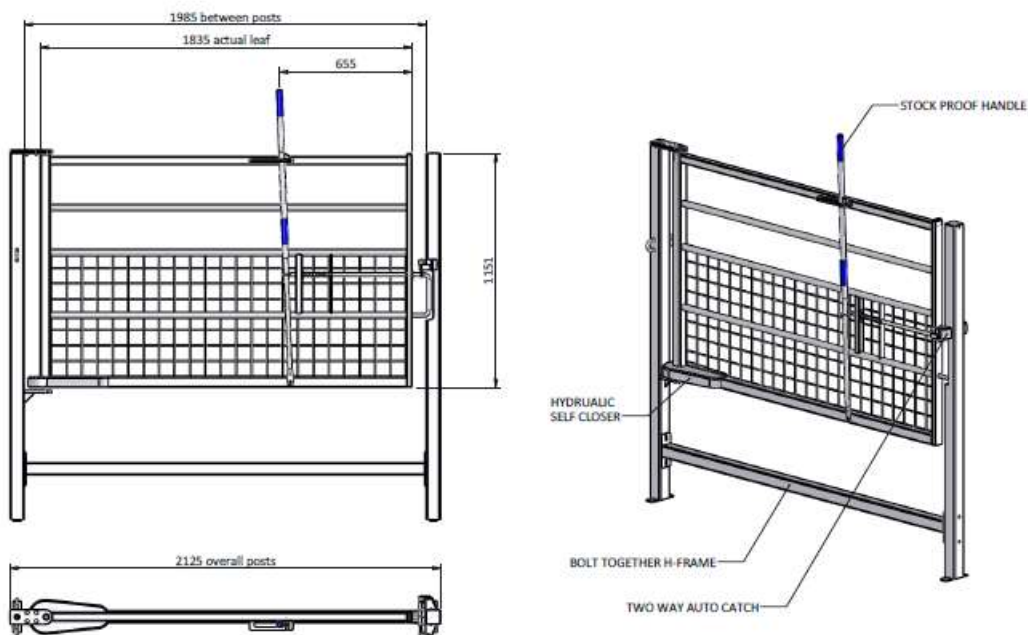
Description: A metal H frame gate with a wider opening of 1.73m. It is a self-closing gate. It has a two way opening with a Prosafe self-closing 2 Way hydraulic hinges. It is fitted with a two way autolatch and gate catch and a bridle latch handle.



Additional Information

Following a further meeting with BHS / Natural England/ BS5709 working party, and upon examination of a MK1 prototype, further modifications were undertaken which resulted in the MK2 revised Worcester Gate

- It is fitted with a stock proof handle which has been newly designed with a round handle to test whether this is "easy to use by equestrians."
- The handle is set back further on the actual gate to test whether the position is easier and safer to use
- It incorporates a bush on the retractable D loop mechanism for a lighter, smoother action and a lighter return spring. Again this is included to test for ease and safe use.



Gate 5: Portail Equestre

Description: A metal gate with an opening of 1.50m. It is a self-closing gate. It has a two way opening with a rising self-closing pivot hinge. There is no gate latch; the handle is a 'top ring handle' positioned above the gate and is designed to be pushed up or pulled down to release the opening mechanism.

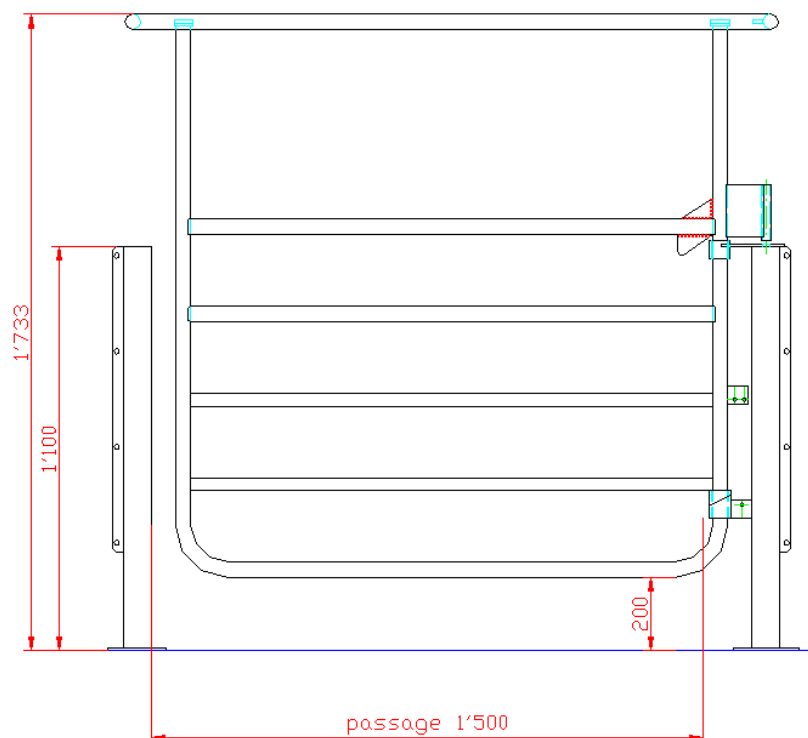


Additional Information

This gate originated from the Jura, Switzerland. Members of the BHS became aware of a u tube video and were impressed by its action. It features:

- The top ring handle; it will allow testing of this novel design and see if it improves control over the gate and prevents overbalancing when equestrians reach for the handle

Technical Drawing



Gate 7: The Chiltern one-way Gate.

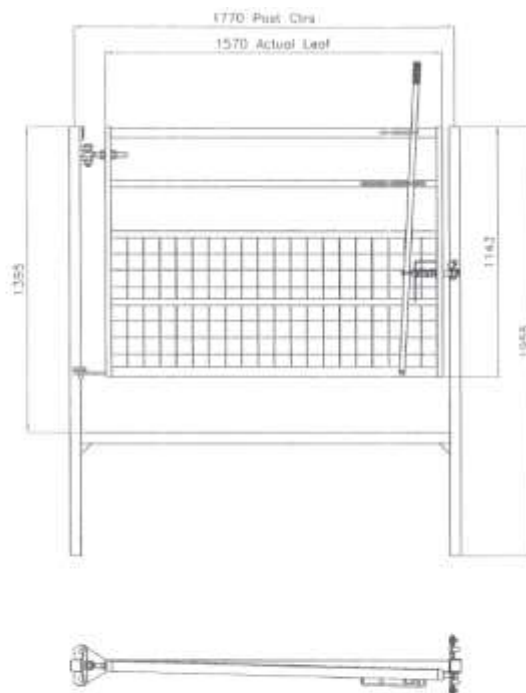
Description: A metal H frame gate with a standard opening of 1.50m. It is a one way self-closing gate with an offset hinge system. It is fitted with a one way auto latch gate catch and a bridle gate handle.

Additional Information

This was put forward by Centrewire as a widely used gate; it also allows the trial to test the one way design and the offset hinge system



Technical Drawings



SPECIFICATION
 50 x 50mm RHS H-FRAME
 50 x 25mm RHS HANG & SLAM STILES
 Ø45mm CHS TOP & BOTTOM RAILS
 Ø30mm CHS OTHER RAILS
 76 x 76mm WELD MESH

VTREWIRE 1782 339348 1782 339348 f.sales@centrewire.com www.centrewire.com	PRODUCT RANGE TWO WAY GATES DRG No. CENT-7D-1009	ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN MILLIMETERS UNLESS INDICATED OTHERWISE Ø 0.02mm - 0.1 0.2mm 100 - 200mm ± 0.2mm 200 - 300mm ± 0.3mm	DRAWN BY CHECKED BY DATE	DATE SCALE 1:1	REV. NO. DESCRIPTION 001
	TITLE CHILTERN BRIDLE GATE TWO WAY OPENING				

Gate 8: Compton Bridle Gate

Description: A metal H frame gate with a standard opening of 1.50m. It is a two way self-closing gate with an offset hinge system. It is fitted with an easy –access latch with a bridle gate handle

Additional Information

This was put forward by Secure-A- Field as a widely used gate; it also allows the trial to test the two way design with an offset hinge system



Technical Information

Non available

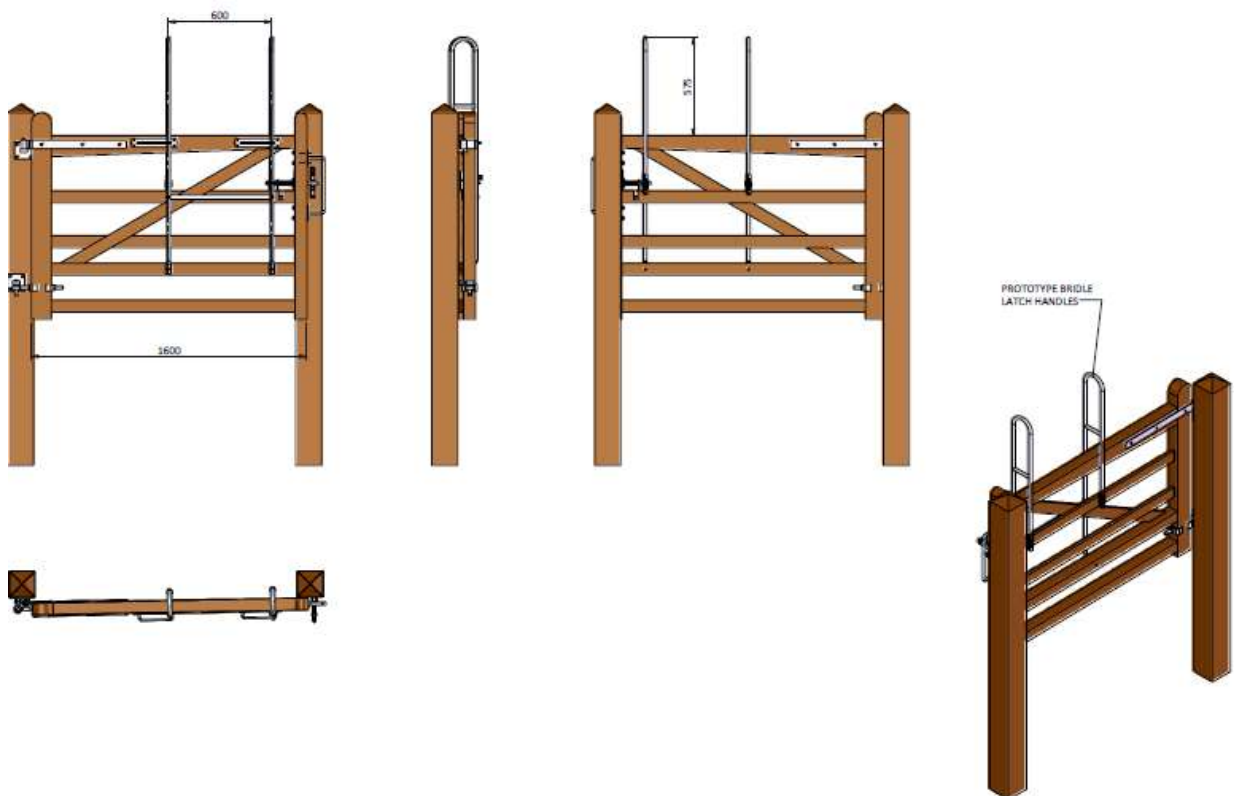
Gate 9: Timber standard width gate

Description: A wooden gate with an opening of 1.63m. It is a self-closing gate. It is one-way opening and is fitted with a one-way autolatch and a double trombone handle.

Additional Information: This has been included in the trial as a control gate to gate 10 which is wider.



Technical Information



Gate 10: Timber extra width gate

Description: A wooden gate with an opening of 2.11m. It is a self-closing gate. It is one-way opening and is fitted with a one-way autolatch and a double trombone handle.

Additional Information: This gate has been included in the trial as part of the recommendations of the 2011 Report to test whether a wider gate made it easier for horses and riders to negotiate.



Technical Information

See Gate 9

Exhibit 3: Excerpts from the BS 5709:2006

Summary of BS5709 2006 clauses for the installer

4.1.1 *There shall be no barbed wire or electric fencing capable of giving a shock, within 1 m of the structure. Similarly there shall be no scratching, stinging, or common rash making plant within 1 m of the structure.*

4.1.2 *The structure shall contain no projections such as bolts likely to catch on the clothing of path users mounted or on foot or to injure people or animals. All edges likely to come into contact with the user shall be rounded to a radius no sharper than 2 mm or chamfered with at least a 2 mm flat. Protrusions integral to the design (e.g. latches) shall be rounded, e.g. using 'D' loops.*

4.1.3 *Where moving parts of the structure could trap fingers, for instance at the gate closure line, the area shall be maximized to reduce the point pressure.*

4.1.5 *The ground within 2 m of the structure and the ground through the structure shall be kept free of surface water (except immediately after rain) and provide a firm surface.*

4.1.9 *The specified requirements shall be checked by visual inspection and measurements which can be carried out on the installed structure.*

NOTE The structure should be built and maintained with adequate strength and rigidity and quality of material and design to meet the requirements in this standard and to ensure the safe and convenient passage of users, as well as providing a reliable barrier to stock if required to do so.

4.4 *Bridle gates shall conform to the following in addition to those above.*

a) *The clear width of bridle gates between posts shall be at least 1.525 m.*

b) *Latches, if fitted, shall be visible, accessible and smoothly and easily operable from both sides of the gate by all path users (mounted or on foot). Shutting the gate shall automatically fasten the latch.*

c) *Gates shall swing freely and a force no greater than 50 N shall be needed to open them fully.*

NOTE 50 N is approximately represented by 5 kg on a spring balance scale.

f) *Gateposts shall not be used as straining posts for a fence.*

g) *In order to reduce shearing action on fingers etc. where two-way gates swing past a post, gates shall be at least 30 mm from the post they swing past (except for any latch area).*

Appendix 4b:

Stock proof testing of gates: Guidance to Stockman

Background

In recent years, self-closing bridle gates have become increasingly popular with both private and public landowners to avoid the possibility of gates been left open. However, it became evident with usage that there is dissatisfaction with the performance of the gates and the BHS was alerted to a number of reports of accidents and near accidents. The result has been both physical injury to horse, and, or rider and fear of using such gates, ultimately, affecting the desire and ability of horse riders to access areas of the countryside.

In order to address this issue in 2011 the BHS trialled six self-closing gates to assess their reliability and ease of use. The results of the trial were published in "*A trial of self-closing bridle gates and a horse-friendly vehicle barrier by The British Horse Society 2011*". The trial produced some interesting findings; these have informed our thinking regarding the gates to be tested and the methodology we are using in the present trial

Following on from the report Natural England and The British Horse Society (BHS) have been working in partnership towards a second trial. The Trial Working Group has agreed the following objectives.

- 1) To determine whether the self-closing bridle gates can be used safely and easily by a range of users, whilst closing within a time frame to prevent escape of livestock.
- 2) To determine whether the self-closing bridle gates remain adequately stock proof when they are closed.
- 3) To determine whether the gates are both of a robust nature and easy to install by an experienced installation professional.

See Exhibit 1 for definitions page 72

In 2015 we will be trialling a number of gates; these have been chosen and developed to address the issues raised in the 2011 trial. In order to have full confidence in the outcome of the trial it is essential that all of the gates are tested to ensure self-closing gates do not succumb to opening by stock.

See Exhibit 2 for listing of gates. page 75

There is no standard procedure to follow for stock proof testing gates, and we are not aware that this has not been undertaken previously. We hope that the following system will show whether the stock are able to push open the gates because of scratching behaviour or from a determined effort to reach the other side.

The aim is that the methodology will be simple to operate and will not add unduly to the daily check on stock.

The field will have had two cuts of silage removed, in May and July. The grass will then be permitted to re-grow to give adequate feed for the stock. The stock will be placed in the field during August.

Because the perimeter fence will be in part removed during this period and because the field is so large an outer electric fence will be erected to create an L shaped outer ring.

Trial Outline

- 1) Ten numbered gates linked by a fence which will stretch to the field boundary. See Diagram 1
- 2) Stock will be placed on both sides of the fence, the stock will be cows.
- 3) One way gates will be installed in such a way that the opening side is always on the same side of the fence. Therefore the gates will open outwards from the inner paddock to the L shape

The ask of the stockman

- 1) Place the stock on both sides of the fence as shown in Plan 1 for the duration of the trial.
- 2) The cows on the one side of the fence will be marked with a coloured tape around their tails. This is so they can be easily distinguished from the cows on the other side of the fence.
- 2) Close all of the gates and loosely tie a piece of coloured string around the non-hinge side of the gate and the post at the top, bottom and the middle. The "knot " should be loose enough to allow the string to come undone when the gate is pushed open, but not so loose that it will fall of its own accord. It is requested that 3 strings be used; 1 or even 2 strings may fall off accidentally, it is unlikely that 3 will do so.
- 3) Place cattle cake in the L shape in troughs on one side of the fence opposite gate 1 and 10 feet away from the gate, repeat for 2 days. Repeat for two days with each gate. The thinking behind this is that the cows without cake will be attracted by the cows eating the cake.
- 4) When checking the stock,
 - a) Note if one or more of the stock is now on the other side of the fence
 - b) Check each gate in turn to see if there is evidence that the gate has been opened either by observing that the gate is resting on the latch or that the strings have fallen off.

You will be supplied with a table to fill to note down your findings.

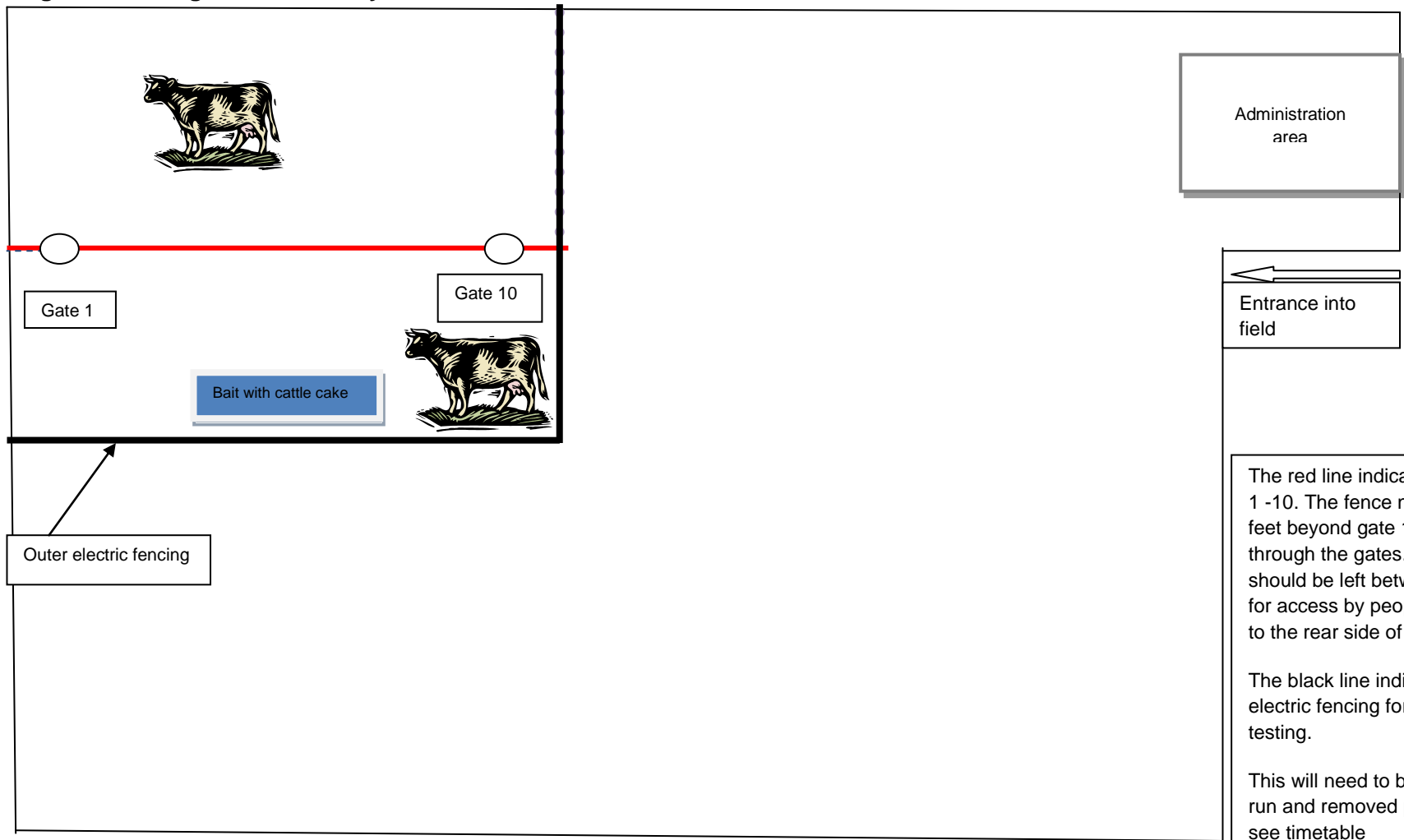
Exhibit 1: Definitions of Terminology

- Ease of use: That the gates should be opened without difficulty or struggle by a range of users including horse riders, users of mobility vehicles, older and weaker users, cyclists, and by the visually impaired.
 - It is acknowledged that a degree of familiarisation may be required with new mechanisms by certain groups of users.
- Safe use: That the users are able to pass through the gate without the gate impeding their passage by closing too quickly and without any part of the structure causing a danger to the users and their horses.
 - This may involve testing a range of closing speeds for each of the gates and must not affect the gate remaining stock proof – see below .
- Stock Proof: So that when the gate is closed the mechanisms are such that they cannot be opened by livestock such as cattle, horses and sheep. Further that the gate closes and fastens after the user has passed through in such a manner that stock is unable to follow.
- Robust: That the gate is of sufficient quality and resilience that a period of normal use does not result in a loss of the above qualities, namely, ease of use, safe use and stock proof-ness. In addition, when installed according to instructions the gates will fulfil these criteria and will not require further adjustment during the period of the trial.

Exhibit 2: Gates to be included in the trial

Gat e No	Name	Width (metres)	Supplied by
1	CONTROL GATE: Two-way non self-closing wooden gate with latch	1.63	Centrewire
2	Original Worcester:	1.52	Centrewire
3	Modified Worcester MK1	1.73	Centrewire
4	Modified Worcester MK2	1.73	Centrewire
5	Portail Equestre	1.50	Constructeur Metallique
6	Alton Gate	1.73	Centrewire
7	Metal 1 Way self - closing gate – offset hinge.	1.50	Centrewire
8	Compton 2 way self-closing hinge	1.63	Secure – a – field:
9	Timber one way self-closing with offset hinges	1.63	Centrewire
10	Timber one way self-closing with offset hinges	2.11	Centrewire

Diagram1: Cottage field fence layout



The red line indicates the fence line with gates 1 -10. The fence needs to protrude at least 20 feet beyond gate 1 and 10 to funnel the horses through the gates. A space of at least 25 feet should be left between gate 1 and the hedge for access by people and horses to go around to the rear side of the gate/ fence line.

The black line indicates the position of the electric fencing for the duration of the stock testing.

This will need to be erected after the dummy run and removed prior to the training video – see timetable

Appendix 4c:

Guidance for Trial Managers.

General Information

1. This is a windy site and with September being unpredictable please come prepared. We have arranged to have a number of mini marquees however inevitably some roles will mean being out on the field and may involve being relatively inactive.
2. The trial starts at 10: am and restarts at 14:00- if at all possible please come 30 minutes before this. However if you cannot do this please come over to the gate trial tent where you will be issued with any pertinent information and a high visibility vest.

Meet and Greeter

Role:

1. Welcome new arrivals to the trial. Explain where to go for trial, parking and facilities.
2. Give assistance if required
3. Tidy up at end of day

Guidance: We are expecting participants to arrive approximately 15 minutes before their allocated slots. Should they arrive by vehicle please ensure they park to the left of the entrance gate in the area marked with white line marker. Should they be unable to walk due to having disability they can park nearer to the trial this will be marked with white line marker. Please tell them to go to the right of the line of gates where they will find a participant instructor (when available) or the tent and be able to pick up or be given:

- The Informed Consent Information Sheet and Form which must be completed before anyone starts the trial.
- The background questionnaire to fill in before commencing the trial
- Their participant number
- instructions on how to undertake the trial

Please also inform participants where the toilet is. This will be situated by the entrance gate.

Please also be prepared to give more assistance where it is needed.

On the way out please remind the participants that others may be coming in so to take care.

You will be provided with:

- A list of the expected participants. We have arranged the slots so that we can take a couple of people more than expected. Please mark the attendance sheet with +1 or

+2. We do not need to know their names. Please text the tent organiser with this information so they are not confused.

- A mini marquee in which to shelter

Participant instructor

Role

1. Is based on the trial site and informs the participants when to begin the trial - ensuring that both camera operatives are ready to film their progress.
2. In the case of horse riders you will inform the participant at which gate to begin the trial. This is because we are operating a rota of gates so that gate 1 is not always the first gate and gate 10 is not always the last.
3. Ensures that the participants go back to the trial tent to complete the questionnaire - or act as scribe where a participant would like assistance filling in the Gates Questionnaire.
4. Help with tidying up at the end of the day.

If any of the participants have problems you should inform them that

- they can take a rest and commence when they are ready
- Miss out a gate (you should open it for them so that they can pass through to the right side.
- Abandon the trial.

You will need to use your judgement.

You will need to liaise with the tent supervisor and the camera operators to ensure that we all understand what is happening.

See Tent organiser's role for participant numbering system.

Tent Organiser

Role

1. Hand out packs to the participants
2. Ensure that the consent form is signed and filed in the correct bag.
3. Give each participant a number. Each of the questionnaires will have a number and the participant will be given a corresponding number to be pinned on their back
 - a. Horse riding participants will be given numbers 1 - 100
 - b. Non horse riding participants will be given numbers 101 – 200

- c. Farmers will be given numbers 201 – 250
 4. Questionnaire.
 5. Ensure the questionnaires are filled in correctly and put away safely
 6. Help the participants with the questionnaires where required.
 7. Tidy up and ensure safekeeping of information at the end of the day.
- You will be provided with Participant packs, Event numbers and safety pins, consent forms.
 - Although you will be in the tent all of time you are employed on this role please note it may still be cold.

Tent Assistant and Runner

Role

1. Assist tent organiser during busy periods
 2. Acts as a scribe to help participants complete the questionnaires.
 3. Communicate between the all parties across the site.
 4. Help to make the participants welcome on site and offer them refreshment
 5. Assist the camera operatives and if necessary take batteries to be recharged. Fill flasks with hot water.
- You will need to be very proactive and find out where the problems are across the site.
 - Please make sure you are familiar with the rota
 - **See Tent organiser's role for participant numbering system.**

Guidance

We are expecting a number of people who have visual impairments and disabilities. Although we have a list of whom may need help, this is not comprehensive.

There will be 2 tents in the area of the trial

Tent 1 will contain the questionnaire packs and all that is necessary to fill them in and store the completed questionnaires

Tent 2 will act as a refreshment tent.

Camera Operatives

Role

1. To capture the passage of the individuals through the gates in a consistent and accurate manner.

Guidance

2. You will be provided with a Go Pro Camera to be operated from a harness worn around the chest.
3. The camera contains a memory card which should last all day. The camera is operated from a battery this will need to be changed we estimate every 2 hours. We should have sufficient batteries to last the day with a change at 12:00, and 16:00.
4. There are 2 camera operative, one to film from the south side and one from the north. The gates are each numbered and show whether they are north or south for instance 5S is gate number 5 on the South side.
5. When videoing the participants you will need to move down the gate line with the participants.
 - a. A dot is provided for standing on at each gate. Red for horse riders and Blue for non – horse riders. The Blue dots are nearer to the gate than the red dots.
 - b. Non horse riders are being asked to complete the gates beginning at gate 1 north and ending with gate 10. Then repeat the exercise beginning on the other side beginning with gate 10 south.
 - c. Horse riders will only be asked to try the gates once. We have a rota to ensure that all gates are trialled in the same manner. The participant instructor will ensure that you and the horse rider know where the trial should commence.
 - d. Although each gate and each participant are given a number for identification the dummy run showed that it is at times difficult to make these out on the footage.
 - i. The camera is fitted with a loud speaker which can hear what you are saying. So please say the gate and participant number at the beginning of each piece of footage. E.g. gate 7 south participants 105, gate 8 south participants 105 and so on.

- ii. Please turn the camera off between each participant. The camera seems to have a glitch which means that every 10 minutes of constant running it turns off and begins again. !
- iii. **See Tent organiser's role for participant numbering system.**

Equipment

- Batteries: Please put batteries in need of recharging in the box labelled **Batteries to be recharged**, and pick up spare batteries from the box labelled **recharged batteries**. Spare batteries will be kept in the questionnaire tent.
 - Recharged batteries should be put into the camera at 10:00, 12:00 and 16:00 hours.
- Memory Cards: a new memory card should be put into the camera at the beginning of each day. At the end of the day memory cards should be put into an enveloped labelled with the date. They should be put into a plastic box labelled **used memory cards**. The box will be locked away as it carries confidential material.
- The Go Pro Camera and Harness should be given to Pippa at the end of each day.

Appendix 5:

Invitations to participate in the trial and background information

- Horse riders: Appendix 5a
- Non horse riding: Appendix 5b
- Farmers: Appendix 5c

Appendix 5a:

Invitation to Horse Riding Participants

Trial to assess self- closing bridle gates 2015

Askham Bryan, Askham Fields Lane, North Yorkshire YO23 3FR

Background: In recent years, self -closing bridle gates have become increasingly popular with both private and public landowners to avoid the possibility of gates being left open. However, it became evident with usage that there is dissatisfaction with the performance of the gates and the BHS was alerted to a number of reports of accidents and near accidents. The result has been both physical injury to horse and or rider and fear of using such gates, which ultimately affects the desire and ability of horse riders to access areas of the countryside.

In order to address this issue in 2011 the BHS trialled six self- closing gates to assess their reliability and ease of use. The results of the trial were published in “*A trial of self-closing bridle gates and a horse-friendly vehicle barrier by The British Horse Society 2011*”. The trial produced some interesting findings; these have informed our thinking regarding the gates to be tested and the methodology we are using in the present trial.

Aims: The aims of this trial are to test a number of gates to find which, if any, meet the needs of land manager’s while being sympathetic to the needs of all potential users of the gate. The findings from the trial may also be used to inform the British Standards Committee for BS 5709: gaps gates and stiles, and by future gate manufacturers to improve their designs. We will therefore be inviting horse riders, cyclists and pedestrians of varying abilities and users of mobility vehicles.

The Ask: We ask you, the participant, to test up to eleven gates by passing through them. Some of the gates may be familiar to you, whilst others may not. We would like you to traverse the gates at your own pace.

If you, or your horse, need to take a rest between gates then you are at liberty to do so.

We will collect information in the form of videos showing your passage through the gates. The video evidence is a record for us to assess whether the gates have features that make it easy and safe for a user to pass through, or conversely, if there are features which create a difficulty in usage. We are not assessing how good you are at using the gates. We will also ask you to fill in a questionnaire; this will not be asking you any personal details so there is no risk that the information you provide will be traced back to you as an individual. The questionnaire records information which may have an affect how you can use gates as well as your perceptions about the gates.

We will ask you to wear a number which will be an identifier so that we can correlate the questionnaires with the video clips. This number will not correlate with your contact details.

Informed Consent

We will ask you to sign a consent form allowing us to use the video evidence for purposes of assessment of the gates. If you are not happy to give this consent we will not be able to include you in the trial. Unfortunately we will not be able to admit spectators, so please only volunteer for the trial if you feel able to sign this part of the consent form.

Trial Dates and times:

The trial will take place between the 18 – 24 of September. For safety and timings we will keep horse riders and non- horse riders separate. A timetable is included at an Exhibit 1.

Fri:	18 September (pm)	Pedestrian Users, cyclists and users of mobility vehicles
Sat:	19 September	Pedestrian Users, cyclists and users of mobility vehicles
Sun:	20 September	Horse riders from the locality
Mon:	21 September	Horse riders from the locality and Askham Bryan
Tues:	22 September	Horse riders from the locality and Askham Bryan
Wed:	23 September	Horse riders from the locality and Askham Bryan
Thurs:	24 September (am)	Pedestrian Users, cyclists and users of mobility vehicles

Joining the trial

The days will be arranged in 1 hour slots and we will batch an appropriate number in each of those slots as follows: 10:00, 11:00, 14:00, 15:00, 16:00, and 17:00.

If you would like to join the trial please email nicola.harper@naturalengland.org.uk please also copy in the individual who originally contacted you if you have their email address. Please include in the email your first and if possible second and third choice for timetabling.

If you would like to discuss any aspect of the trial please contact myself Nicola Harper on 07900 608 190 or for horse riders ring the BHS access department on 0247 684 0515.

Once we have received your preferences we will send further information.

On the day

Please be ready to start the trial at least 15 minutes before your allotted slot. You will be greeted by a trial manager who will answer any questions you have and ask you to complete a consent form and begin the questionnaire.

There will be a toilet on site and we will provide “camping style” tea, coffee and biscuits.

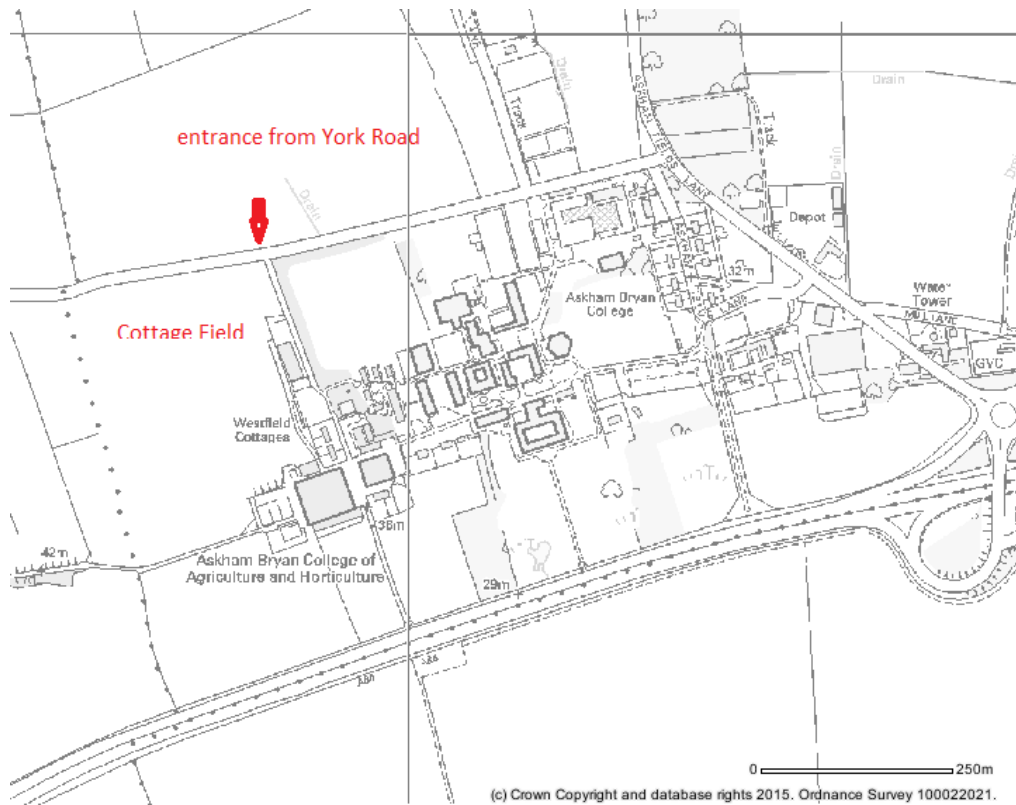
For Horse riders:

‘Protective headwear that meets a BHS recognised standard, should be worn at all times. These standards are PAS:015:1998 or 2011, BSEN1384:1997 or 2012, EN1384:1996, ASTM F1163:2004a, SNELL E2001, AS.NZS 3838 2006. Hats should carry a quality assurance mark such as the BSI Kitemark, or SEI marking.

Please note that no protective equipment has the power to protect against every injury, but it should protect against the severity of the injury.’

Directions and Parking

You will be able to park at Cottage field please see map below



Appendix 5b:

Invitation to non- Horse Riding Participants

Trial to assess self- closing bridle gates 2015

Askham Bryan, Askham Fields Lane, North Yorkshire YO23 3FR

Background: In recent years, self -closing bridle gates have become increasingly popular with both private and public landowners to avoid the possibility of gates being left open. However, it became evident with usage that there is dissatisfaction with the performance of the gates and the BHS was alerted to a number of reports of accidents and near accidents. The result has been both physical injury to horse and or rider and fear of using such gates, which ultimately affects the desire and ability of horse riders to access areas of the countryside.

In order to address this issue in 2011 the BHS trialled six self- closing gates to assess their reliability and ease of use. The results of the trial were published in “*A trial of self-closing bridle gates and a horse-friendly vehicle barrier by The British Horse Society 2011*”. The trial produced some interesting findings; these have informed our thinking regarding the gates to be tested and the methodology we are using in the present trial.

Aims: The aims of this trial are to test a number of gates to find which, if any, meet the needs of land manager’s while being sympathetic to the needs of all potential users of the gate. The findings from the trial may also be used to inform the British Standards Committee for BS 5709: gaps gates and stiles, and by future gate manufacturers to improve their designs. We will therefore be inviting horse riders, cyclists and pedestrians of varying abilities and users of mobility vehicles.

The Ask: We ask you, the participant, to test up to eleven gates by passing through them. Some of the gates may be familiar to you, whilst others may not. We would like you to traverse the gates at your own pace.

If you, need to take a rest between gates then you are at liberty to do so.

We will collect information in the form of videos showing your passage through the gates. The video evidence is a record for us to assess whether the gates have features that make it easy and safe for a user to pass through, or conversely, if there are features which create a difficulty in usage. We are not assessing how good you are at using the gates. We will also ask you to fill in a questionnaire; this will not be asking you any personal details so there is no risk that the information you provide will be traced back to you as an individual. The questionnaire records information which may have affect how you can use gates as well as your perceptions about the gates.

We will ask you to wear a number which will be an identifier so that we can correlate the questionnaires with the video clips. This number will not correlate with your contact details.

Informed Consent

We will ask you to sign a consent form allowing us to use the video evidence for purposes of assessment of the gates. If you are not happy to give this consent we will not be able to include you in the trial. Unfortunately we will not be able to admit spectators, so please only volunteer for the trial if you feel able to sign this part of the consent form.

Trial Dates and times:

The trial will take place between 18 – 24 of September. For safety and timings we will keep horse riders and non- horse riders separate. A timetable is included at an Exhibit 1.

Fri: 18 September (pm) Pedestrian Users, cyclists and users of mobility vehicles

Sat: 19 September Pedestrian Users, cyclists and users of mobility vehicles

Thurs: 24 September (am) Pedestrian Users, cyclists and users of mobility vehicles

Joining the trial

The days will be arranged in 1 hour slots and we will batch an appropriate number in each of those slots as follows: 10:00, 11:00, 14:00, 15:00, 16:00, and 17:00.

If you would like to join the trial please email nicola.harper@naturalengland.org.uk please also copy in the individual who originally contacted you if you have their email address. Please include in the email your first and if possible second and third choice for timetabling.

If you would like to discuss any aspect of the trial please contact myself Nicola Harper on 07900 608 190.

Once we have received your preferences we will send further information.

Appendix 5C:

Invitation to Farmers

Trial to assess self- closing bridle gates 2015

Askham Bryan, Askham Fields Lane, North Yorkshire YO23 3FR

Background: In recent years, self -closing bridle gates have become increasingly popular with both private and public landowners to avoid the possibility of gates being left open. However, it became evident with usage that there is dissatisfaction with the performance of the gates and the BHS was alerted to a number of reports of accidents and near accidents. The result has been both physical injury to horse, and, or rider and fear of using such gates, ultimately, affecting the desire and ability of horse riders to access areas of the countryside.

In order to address this issue in 2011 the BHS trialled six self- closing gates to assess their reliability and ease of use. The results of the trial were published in “*A trial of self-closing bridle gates and a horse-friendly vehicle barrier by The British Horse Society 2011*”. The trial produced some interesting findings; these have informed our thinking regarding the gates to be tested and the methodology we are using in the present trial

Aims: The aims of this trial are to test a number of gates to find which, if any, will meet the needs of land manager’s while being sympathetic to the needs of all potential users of the gate.

In order to meet these aims the trial will be in two parts. In part 1 we will be “stock- testing” the gates. As far as we are aware this has not been done before but we have been made aware by the NFU and the CLA that it is important that this should be undertaken. We will be testing the gates with cattle and encouraging them to put pressure on the gates as follows:

Stock testing outline

- 4) Ten numbered gates linked by a fence which will stretch to the field boundary. See Diagram 1
- 5) Stock will be placed on both sides of the fence, the stock will be cows.
- 6) One way gates will be installed in such a way that the opening side is always on the same side of the fence. Therefore the gates will open outwards from the inner paddock to the L shape

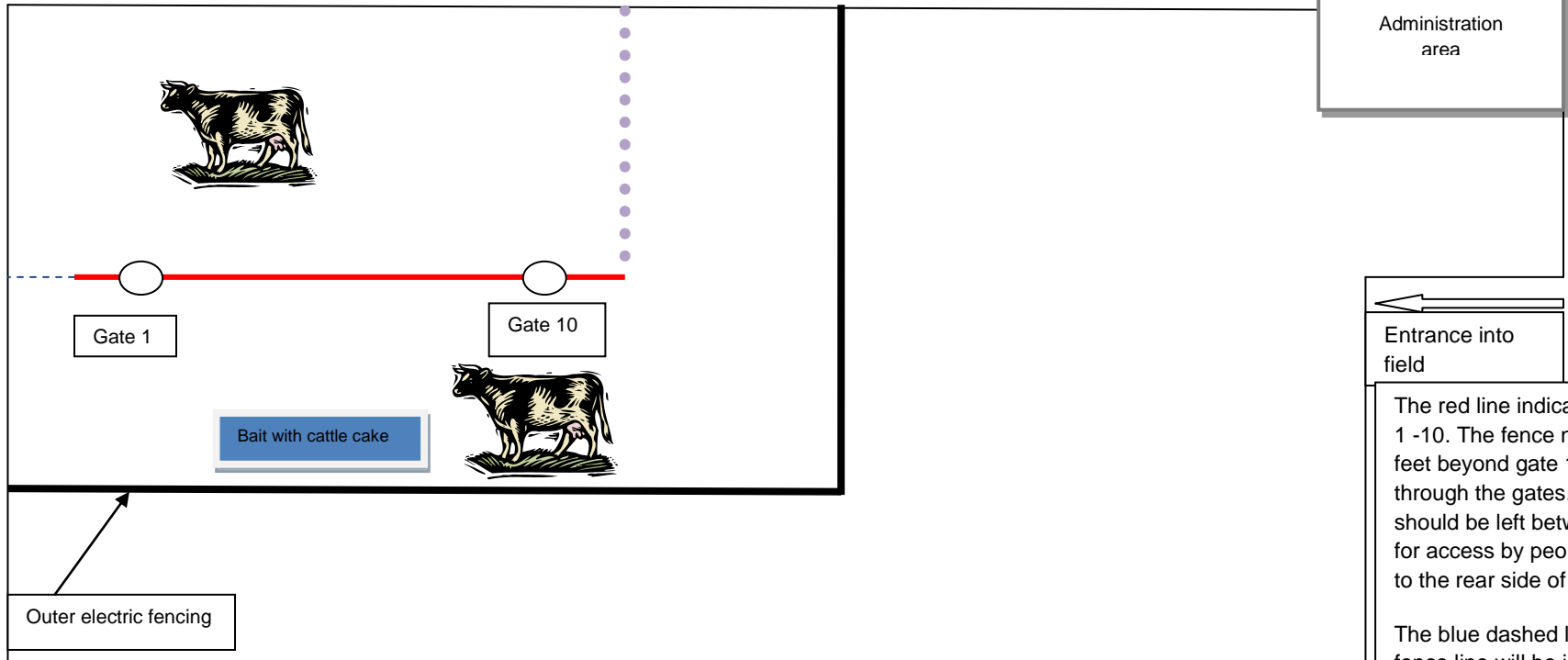
The ask of the stockman

- 1) Place the stock on both sides of the fence as shown in Plan 1 for the duration of the trial.

- 2) The cows on the one side of the fence will be marked with a coloured tape around their tails. This is so they can be easily distinguished from the cows on the other side of the fence.
- 2) Close all of the gates and loosely tie a piece of coloured string around the non-hinge side of the gate and the post at the top, bottom and the middle. The “knot “ should be loose enough to allow the string to come undone when the gate is pushed open, but not so loose that it will fall of its own accord. It is requested that 3 strings be used; 1 or even 2 strings may fall off accidentally, it is unlikely that 3 will do so.
- 3) Place cattle cake in the L shape in troughs on one side of the fence opposite gate 1 and 10 feet away from the gate, repeat for 2 days. Repeat for two days with each gate. The thinking behind this is that the cows without cake will be attracted by the cows eating the cake.
- 4) When checking the stock,
 - c) Note if one or more of the stock is now on the other side of the fence
 - d) Check each gate in turn to see if there is evidence that the gate has been opened either by observing that the gate is resting on the latch or that the strings have fallen off.

The stockman will be supplied with a table to fill in and note down their findings.

Diagram1: Cottage field fence layout



The red line indicates the fence line with gates 1 -10. The fence needs to protrude at least 20 feet beyond gate 1 and 10 to funnel the horses through the gates. A gap of at least 25 feet should be left between gate 1 and the hedge for access by people and horses to go around to the rear side of the gate/ fence line.

The blue dashed line indicates where the gate/ fence line will be joined to the hedge for the duration of the stock testing. This will need to be done with post and rail after the dummy run on the 4 June is complete.

The purple dots indicate where the line will be joined to the hedge for the purpose of stock testing. We think this can be done by electric fencing which will be easier to remove.

Both the dashed line and the dotted line will need to be removed prior to the trial in September.

In part 2 we will be asking a wide range of potential users to pass through the gates. We will collect information in the form of videos showing the passage through the gates. The video's evidence is there to assess whether the gates have features that make it easy and safe for a user to pass through, or conversely, if there are features which create a difficulty in usage. We are not assessing how good the participant is at using the gates. We will also ask participants to fill in a questionnaire; this will not asking personal details so there is no risk that the information provided will be traced back to the individual. The questionnaires are there to record information which will have a bearing on the use of the gate as well perceptions about the gates.

We will ask participants to sign a consent form allowing us to use the video evidence for purposes of assessment of the gates. If participants are not happy to give this consent we will not be able to include them in the trial. In addition, we will give participants two further options. Option 1 is to give permission for the video evidence to be used for other purposes such as demonstrating to manufacturers and the British Standard Committee the problems or advantages of gates. Whilst Option 2 is to give permission for the footage to be uploaded onto U tube. Participants may or may not be happy to sign either or both of these options; it will not affect their inclusion in the trial.

We will ask participants to wear a number which will be an identifier so that we can correlate the questionnaires with the video clips. This number will not correlate with their contact details.

Your comments on the gates

When you visit the gates trial we will ask you to assess each gate and provide feedback to us on your opinions. You will be asked to comment on your assessment of the security of the closure of the gate, (do you think it could be opened by stock), the closing of the gate from being fully open, the robustness of the gate, the robustness of the gate furniture (hinges, catches and handles), and your experience as a user of the gate. We are not making video evidence a mandatory part of the trial in the case of farmers, but, if you wish video evidence to be included in the trial we would ask you to sign a consent form.

Appendix 6:

List of organisations that participated in the Bridle gate Trial 2015

Organisation
The British Horse Society
North Yorkshire National Park
Craig Grimes Ltd
Open Country
Disabled Ramblers
Askham Bryan Equestrian Centre
Poppleton Walking Group
Field Fare Trust
Phil Chambers Consultancy
Ramblers
Devon LAF
National Trust
Sustrans
NFU
British Cycling
East Riding of Yorkshire Council
Ride Yorkshire
Eyecan / RSB

Appendix 7: Background Questionnaires

Appendix 7:

Background questionnaire's for

- Horse riders : Appendix 7a
- Non- horse riders: Appendix 7b
- Farmers: Appendix 7c

Appendix 7a:

Background Questionnaires for horse riders

HORSE RIDERS

Are you male or female ? Male _____ Female _____

What was your age last birthday? _____

Please give your height (in either metric or Imperial measurements) _____

Do you have any long standing illness, health problem or disability that limits your daily activities or the kind of work you can do ?

Yes _____ No _____

Do any of these conditions or illnesses affect you in any of the following areas?

Vision (for example blindness or partial sight)	
Mobility (for example walking short distances or climbing stairs)	
Dexterity (for example lifting and carrying objects, using a keyboard)	
Learning or understanding or concentrating	
Memory	
Other (please specify below)	
None of the above	
Would rather not say	

Other condition _____

Which of the following categories best describes that way you usually access the countryside ? Please tick one.

I walk/ramble/run	
I use a mobility vehicle (manual or powered)	
I cycle	
I ride a horse/pony	

What size (in hands) is the horse you are riding today ?

Less than 14.2 hands	
14.2 to 16.2 hands	
Larger than 16.2 hands	

What size (in hands) is the horse you usually ride ?

Less than 14.2 hands	
14.2 to 16.2 hands	
Larger than 16.2 hands	

What is your highest riding qualification ? Please circle as appropriate.

Up to or including :

Pony Club Silver/D Test

Pony Club Gold/C Test/ Road Rider Achievement Badge

Pony Club Platinum / Road Rider Test

Pony Club B (riding)/Lunging Test

Pony Club A Test

BHS Diploma Level 1 / 2 / 3 / 4

BHS Teaching Level 5 or above

BHS Equine Tourism Ride Leader Level 2 or Level 3

None

Other, please state _____

**How confident are you usually when you're negotiating gates in the countryside ?
Please tick only ONE response.**

very confident	
fairly confident	
not very confident	
not at all confident	
depends on the horse I'm riding	
depends on the route I'm taking	

Have you ever had an accident leading to injury of you or your horse when negotiating a gate ?

I've never had, nor witnessed, an accident.		
I've never had an accident myself, but I have witnessed one.		
Yes – I've had one accident		If you answer yes please also answer the question below.
Yes – I've had more than one accident		

If you answered YES above please tick all that apply.

I have been injured	
The horse I was riding was injured	

End of background questions.

Thank you.

Appendix 7b

Background questions for Non- Horse Riders

Are you male or female ? Male _____ Female _____

What was your age last birthday? _____

Please give your height (in either metric or Imperial measurements) _____

Do you have any long standing illness, health problem or disability that limits your daily activities or the kind of work you can do ?

Yes _____ No _____

Do any of these conditions or illnesses affect you in any of the following areas?

Vision (for example blindness or partial sight)	
Mobility (for example walking short distances or climbing stairs)	
Dexterity (for example lifting and carrying objects, using a keyboard)	
Learning or understanding or concentrating	
Memory	
Other (please specify below)	
None of the above	
Would rather not say	

Other condition _____

Which of the following categories best describes that way you usually access the countryside ? Please tick one.

I walk/ramble/run	
I use a mobility vehicle (manual or powered)	
I cycle	
I ride a horse/pony	

If you use a mobility aid please indicate the type you usually use when accessing the countryside.

Self-propelled wheelchair	
Attended wheelchair	
Powered wheelchair	
Pavement scooter	
Off-road scooter/ Mountain trike/Tramper	

Other _____

If the mobility aid you are using for today's trial is different to your usual one please tick the relevant box.

Self-propelled wheelchair	
Attended wheelchair	
Powered wheelchair	
Pavement scooter	
Off-road scooter/ Mountain trike/Tramper	

Annex 7c

Background questionnaire for farmers

Q1. Are you male or female ?

Male	
Female	

Q2. What was your age last birthday?

Q3. Please give your height in either metric or Imperial measurements.

Q4. Do you consider yourself to have a disability ?

Yes	
No	

Q5. From the list in the table below which, if any, affect the work you do? Please tick all that apply.

Vision	
Hearing	
Mobility	
Manual dexterity	
Learning or understanding or concentrating	
Memory	
None of the above	

If you have another condition that affects the work you do please tell us what it is:

Q6. How many years have you worked in farming as an adult ?

Fewer than 2 years	
2 – 5 years	
5 – 10 years	
More than 10 years	

Q7 What livestock, if any, do you manage ? Please tick all that apply.

Cattle	
Dairy	
Beef	
Pigs – outdoors only	
Sheep	

Poultry – outdoors only	
Horses	
Deer	
Goats	

Other please state: _____

Q8. What rights of way do you have on you land ? Please tell us how many of each.

	Number which are public	Number which are private	
Footpaths			Please go to Q12 on the next page.
Byways			
Bridleways			Please go to Q9 below.

If you don't have any rights of way on your land please tick this box then put your completed questionnaire in the bag marked 'BACKGROUND QUESTIONNAIRES'. Thank you.

Q9. Thinking about the bridleways you have please tell us about any gates you currently use.

Type of gate	Number of gates of this type	
Wooden self-closing		Please go to Q10 on the next page.
Wooden non self-closing		
Metal self-closing		
Metal non self-closing		

I don't use bridle gates on my land		Please go to Q12 on the next page.
-------------------------------------	--	------------------------------------

Q10. What problems, if any, have you experienced with the bridle gates you currently use. Please tick all that apply.

Gates left open by the public	
Stock following users through gate	
Gates opened by stock	
Accidents involving gates	
Injuries to people involving gates	
Injuries to horses involving gates	
Maintenance problems	
No problems with the gates on my land	

Other, please give details:

Q11. If you have a preferred type of gate please tell us what it is, and tell us the manufacturer and model if you can.

Q12. If you have public rights of way on your land (footpaths, byways or bridleways) please tell us how often you check the following:

	Daily	Weekly	Monthly	Annually	When I move stock	When I get complaints
Gates						
Stiles						
Signposts						
Waymarkers						

Appendix 8:

Gate questionnaire's for

- Horse riders : Appendix 8a
- Non- horse riders: Appendix 8b
- Farmers: Appendix 8c

Appendix 8a:

Gate Questionnaire for horse riders



- Please answer the following questions about Gate 1N by ticking yes, no, or not sure.

QUESTION	YES	NO	NOT SURE
Is the handle in a good position ?			
Does the gate open easily ?			
Does the gate feel safe to use ?			
Did you have enough time to pass through the gate before it closed ?			
Did the gate close ?			
Did any part of this gate pose a hazard to you as you passed through ?			
Did any part of this gate pose a hazard to your horse as you passed through ?			

If you particularly liked this gate please tell us why?

.....

If you particularly disliked this gate please tell us why.....

Appendix 8b:

Gate Questionnaire for Non – Horse Riders



Please answer the following questions about Gate 1N by ticking yes, no, or not sure.

QUESTION	YES	NO	NOT SURE
Is the handle in a good position ?			
Does the gate open easily ?			
Does the gate feel safe to use ?			
Did you have enough time to pass through the gate before it closed ?			
Did the gate close ?			
Did any part of this gate pose a hazard to you as you passed through ?			
Did any part of this gate pose a hazard to your sighted guide or personal assistant if you have one ?			
Did any part of this gate pose a hazard to your Assistance dog or Guide Dog if you have one ?			

If you particularly liked this gate please tell us why.

If you particularly disliked this gate please tell us why.

Appendix 8c

Gate questionnaire for farmers



Please answer the following questions about Gate 1N by ticking yes, no, or not sure.

QUESTION	YES	NO	NOT SURE
Is the handle in a good position ?			
Does the gate open easily ?			
Does the gate feel safe to use ?			
Did you have enough time to pass through the gate before it closed ?			
Did any part of this gate pose a hazard to you as you passed through ?			
Did the gate close ?			

If you currently have livestock in a field crossed by a footpath or bridleway please answer the following question.

	YES	NO	NOT SURE
Would you use this gate on your land ? (Please imagine that this gate has been fitted with stock proof meshing.)			

If no, please say why not.

Appendix 9:

The criteria against which the video evidence was assessed and the options recorded:

- Horse riders: Appendix 9a
- Non horse riding: Appendix 9b

Appendix 9a:

Horse riders

Criteria Measured	Options Recorded (only one of the options recorded)	
Rider Approach	Heel to hinge Head on	multiple
Possible to reach handle	Easy Stretch	Failed to reach
Handle use	easy Horse collided	Rider struggled to use
gate pushed or pulled	Pulled Pushed	Failed
No of attempts to latch / handle	First attempt Second attempt Third attempt	Fourth attempt or more. NA
passed through the gate on	First attempt Second attempt Third attempt	Fourth attempt or more. NA
quality of gate passage by horse	Horse passes calmly Horse avoids gate	NA
Quality of gate passage by rider	gate bounces too quickly gate closes too quickly rider in control of gate by holding	rider in control of gate not holding NA
rider hit	Yes / No	NA
horse hit	Yes / No	NA
Time for gate to close after hindquarters clear of gate (s)		
gate latched after exit	Yes / No Override	NA

Appendix 9b:

Non- Horse Riders (including farmers)

Criteria Measured	Options Recorded (only one of the options recorded)	
accompaniment	NA Support person assistance dog	pet dog stick as pair
Vehicle	NA Bicycle Powered	Self -propelled pushed
Uses handle or latch	NA Handle	Latch
User finds it easy to locate handle or latch	Yes No	Possible
User finds it possible to reach handle or latch	Easy Stretch	No NA
User finds it possible to operate handle or latch	Easy possible	No NA
gate pushed or pulled	Pushed Pulled	NA
passed through the gate	Yes	No
No of attempts to open gate	First attempt Second attempt Third attempt	Fourth attempt or more Participant gave up NA
Gate bounces back too quickly	Yes No	Override NA
gate hits user	Yes No	NA
gate hits bicycle or mobility vehicle	Yes No	NA
Time for gate to close after participant clears the gate		

Appendix 10:

The Hypothesis against which the data was analysed using the data from the background questionnaires, the gate questionnaires, the video evidence and the spreadsheets.

- Horse riders: Appendix 10a
- Non horse riding: Appendix 10b
- Farmers: Appendix 10c

Annex 10a: Horse riders

Criteria	Hypothesis
Safe Use	2f) Horse riders were able to use all the gates without a risk to their person.
Safe Use	2g) Horse riders were able to use all the gates without a risk to their mounts.
Ease of use	3a) Self closing gates are as easy to negotiate as non -self-closing gates.
Safe use	3b) Self closing gates are as safe to negotiate as non- self-closing gates.
Ease of use	3h)The type of handle influences how easily the rider can open the gate
Safe use	3i)The type of the handle influences whether the bridle becomes tangled in the gate handle.
Ease of use	3j) The type of the handle influences the control that the rider can have on the gate
Safe Use	3k) Slow closure correlates with safe passage through the gate
Ease of use	3l) The force needed to open the gate influences its ease of use by the rider
Ease of use	3m) The width of the gate influences the ease of use by the rider
Safe Use	3n) The width of the gate influences the safe passage to the horse and rider
Ease of use	3o)The viewing of a training video before attempting gates for the first time has an effect on the ease of passage of the gates by the horse rider
Ease of use	3o)The viewing of a training video before attempting gates for the first time has an effect on the ease of passage of the gates by the horse rider
Ease of use	3o)The viewing of a training video before attempting gates for the first time has an effect on the ease of passage of the gates by the horse rider
Ease of use	3o)The viewing of a training video before attempting gates for the first time has an effect on the ease of passage of the gates by the horse rider

Criteria	Hypothesis
Safe use	3p)The viewing of a training video before attempting gates for the first time has an effect on the safe of passage of the gates by the horse rider
Safe Use	3p)The viewing of a training video before attempting gates for the first time has an effect on the safe of passage of the gates by the horse rider
Safe Use	3p)The viewing of a training video before attempting gates for the first time has an effect on the safe of passage of the gates by the horse rider
Safe Use	3q) The self-closing mechanism used in the gate design affects whether the gate hits the horse or rider
Safe use	3r) The riders approach influences how safely the gate is negotiated
Safe use	3s) The riders approach influences how safely the gate is negotiated
Ease of use	3t) Riders prefer to push rather than pull the gate. find pushing easier than pulling there by affecting their use of one way gates.
Safe use	3v)Riders who failed the gate or were hit were more likely to have pushed the gate.
Safe use	3w) The riders approach influences how safely the gate is negotiated

Annex 10b:

Non- Horse riders

Criteria	Audience	Hypothesis
Ease of Use	Pedestrian Non Mobility scooter users and cyclists	1a) Recreational Walkers and cyclists were able to use all the gate designs without any impediment to ease of use.
Ease of Use	Pedestrian Non Mobility scooter users and cyclists	1b) Participants with dexterity problems were able to use all the gate designs without any impediment to ease of use.
Ease of Use	Pedestrian Non Mobility scooter users and cyclists	1c) Visually impaired participants were able to use all the gate designs without any impediment to ease of use
Ease of Use	Pedestrian Non Mobility scooter users and cyclists	1d) People with pet dogs were able to use all the gate designs without any impediment to ease of use
Ease of Use	Mobility Scooter and wheelchair Users	1e) Users of Mobility Scooters and wheelchairs were able to use all the gate designs without any impediment to ease of use
Safe Use	Pedestrians and cyclists (not including Mobility scooter and wheelchair users)	2a) Recreational Walkers and cyclists were able to use all of the gates without a risk to their person.
Safe Use	Pedestrians and cyclists (not including Mobility scooter and wheelchair users)	2b) Participants with dexterity problems were able to use all the gate designs without a risk to their person.
Safe Use	Pedestrians and cyclists (not including Mobility scooter and wheelchair users)	2c) Visually impaired participants were able to use all the gate designs without a risk to their person.
Safe Use	Pedestrians and cyclists (not including Mobility scooter and wheelchair users)	2d) People with pet dogs were able to use all the gate designs without a risk to their person or their dog.
Safe Use	Mobility Scooter and wheelchair Users	2e) Users of Mobility Scooters and wheelchairs were able to use all the gate designs without a risk to their person.
Ease of Use	Mobility Scooter and wheelchair users	4a) Self closing gates are as easy to negotiate as non-self-closing gates

Criteria	Audience	Hypothesis
Safe Use	Mobility Scooter and wheelchair users	4b) Self closing gates are as safe to negotiate as non- self-closing gates.
Ease of Use	Mobility Scooter and wheelchair users	4d) Ease of passage through the gate is different depending on whether the scooter or wheelchair is powered or self- propelled
Ease of Use	Mobility Scooter and wheelchair users	4f) The ability to reach the handle comfortably is an important component in opening the gate.
Ease of Use	Mobility Scooter and wheelchair users	4g) . The ability to reach the latch comfortably is an important component in opening the gate
Ease of Use	Mobility Scooter and wheelchair users	4f) Mobility Scooter and wheelchair users find pushing easier than pulling there by affecting their use of one way gates.
Ease of Use	Mobility Scooter and wheelchair users	4g) Mobility Scooter and wheelchair users use the gate latches more frequently than the handles
Ease of Use	Mobility Scooter and wheelchair users	4h) The style of handle influences the ease of use by Mobility Scooter and wheelchair users
Ease of Use	Mobility Scooter and wheelchair users	4i) The style of latch influences the ease of use by Mobility Scooter and wheelchair users
Ease of Use	Mobility Scooter and wheelchair users	4j) The force needed to open the gate influences its ease of use by Mobility Scooter and wheelchair users
Ease of Use	Mobility Scooter and wheelchair users	4k) The width of the gate influences the ease of use by Mobility Scooter and wheelchair users
Ease of Use	Mobility Scooter and wheelchair users	4l) The speed of closure influences ease of use by Mobility Scooter and wheelchair users
Ease of Use	Mobility Scooter and wheelchair users	4m) The self-closing mechanism used in the gate design affects ease of use by Mobility Scooter and wheelchair users

Criteria	Audience	Hypothesis
Safe Use	Mobility Scooter and wheelchair users	4n) The self-closing mechanism used in the gate design affects safe use by Mobility Scooter and wheelchair users

Appendix 10c:

Farmers

Criteria	Hypothesis
Ease of Use	5b) Farmers own preference for the gate/handle/latch is dependent upon their perception of the preference of the general public.
Stock proof	5c) Farmers preference for handle design is dependent on perceived stock proof-ness of the design
Stock proof	5d) Farmers preference for gate design is dependent on perceived stock proof-ness of the design
Stock proof	5e) Farmers preference for latch design is dependent on perceived stock proof-ness of the design
Stock proof	5f) Farmers preference is for apparent fast closure
Stock proof	5g) Farmers prefer one way self-closing gates for the additional stock proof-ness
Robust ness	5h) Farmers preference is for gate/handle/latch designs that they perceive are easy to install
Robustness	5i) Farmers preference is for gate/handle/latch designs that they perceive are easy to maintain and robust
Usage of gates.	5j) Farmers would use this gate on their land

Appendix 11: Guidance relating to gates on public rights of way

1. Relevant extracts from Defra Circular 1/09 guidance for Local Authorities

6.7 Stiles, gates and other structures on a public right of way are unlawful obstructions on a public right of way unless they are recorded on the definitive statement as a limitation or it can be shown that the way was dedicated with such a structure despite not being recorded on the definitive statement (i.e. the statement requires updating) or have been authorised by the highway authority under section 147 of the 1980 Act. Authorisation to install a structure may only be granted in relation to footpaths or bridleways (but not restricted byways or byways open to all traffic) where the owner or occupier of agricultural land, or land being brought into such use, makes an application showing that the structures are necessary for preventing the ingress or egress of animals. Section 145 of the 1980 Act specifies that a minimum width of 5 feet must be provided for gate across a bridleway. On granting consent for a structure an authority may impose conditions for maintenance or ease of use by members of the public. A highway authority is required to keep a record of any authorisations granted and it is considered good practice to make such records publicly available. It is known that some authorities have poor records of structure authorisations and it would clarify matters if any shortcomings were addressed by reassessment of the validity of structures erected under claimed section 147 agreements.

6.8 The requirements of the Disability Discrimination Act 1995 (as amended by the Disability Discrimination Act 2005) will be particularly relevant in specifying limitations or authorised structures. In authorising a structure, section 147 of the 1980 Act requires the authority to have regard to the needs of persons with mobility problems. Whilst there are no mandatory standards laid down for structures which, if met, will satisfy the requirements of the Disability Discrimination Acts, the British Standards Institute has developed a comprehensive standard, the current version of which has been published as BS5709:2006. The Pittecroft Trust has produced an explanatory *document*³⁰ to describe BS5709:2006. Authorities may develop their own comprehensive standards for the purpose of meeting the requirements of the Acts.

6.10 Under section 146(1) of the 1980 Act, landowners are responsible for maintaining gates, stiles and similar structures across footpaths, bridleways or restricted byways, whether or not they are shown on the definitive map. Authorities must contribute not less than a quarter of the expenses reasonably incurred by landowners in doing so. Where it appears to an authority that the landowner is not complying with his statutory duty, the

authority may give notice to the landowner of their intention to take the necessary steps for repairing and making good the stile, gate or other works. The authority may recover the expenses reasonably incurred on doing so from the landowner.

6.11 Under the provisions of section 147ZA of the 1980 Act a highway authority may enter in to an agreement with a landowner, lessee or occupier for the replacement or improvement of a structure which will make the structure safer or more convenient for members of the public with mobility problems. The agreement may include any temporary or permanent conditions that the authority thinks fit.

2. Relevant extracts from Defra Guidance “Authorising structures (gaps, gates & stiles) on rights of way: Good practice guidance for local authorities on compliance with the Equality Act 2010” Version 1 October 2010

Equality Act guidance for Local Authorities

Main Recommendations

As a matter of good practice, authorities should:

1. have a published policy on how it will meet the requirements of the Equality Act in relation to public rights of way – see Annex D;
2. ensure that any structures they give lawful authority to are clearly specified and documented – see Annex G;
3. consider including in any specification, provision to remove or vary the structure when the need for it changes or ceases – see Annex C;
4. consider displaying information on all lawful structures (including the accessibility) to enable someone with limited mobility to plan routes other than just those that are officially designated as “easy access” – see Annex J.

B.1 The DDA, comprising the 1995 Act as amended by the 2005 Act has now been repealed and its provisions broadly replicated in the Equality Act 2010. There are numerous references to “the public” or “persons” in rights of way legislation; these terms will encompass those members of the public with a disability and the Equality Act therefore applies to all public rights of way. Section 146(1) of the Highways Act 1980 for instance requires a landowner to maintain a gate or stile to a standard that prevents unreasonable interference with the rights of the persons using the way.

B.2 The Equality Act applies to those who are “service-providers”, to those who “exercise public functions” (Part 3) and to every “public authority” (Part 11, Chapter 1). All functions of rights of way departments must therefore consider that the provisions of the Act apply to their service.

B.3 It is important to understand the full scope of the term “disability” in relation to the legislation. For the purposes of the Equality Act the definition provided is that a person has a disability if he or she has a physical or mental impairment which has a substantial and long term adverse effect on his or her ability to carry out normal day-to-day activities. A disabled person is a person who has a disability or who has had a disability in the past. The Equality & Human Rights Commission has provided further explanation⁴ of this definition.

The Social Model of Disability

B.4 Some local authorities have adopted the „*Social Model of Disability*“. This model is based on the principle that disabled people do not face disadvantage because of their disabilities, but experience discrimination because of the way we organise society. This includes failure to make public services accessible, failure to remove barriers of assumption, stereotype and prejudice, and failure to outlaw unfair treatment in our daily lives. The social model looks beyond a person’s disability to *all* the relevant factors that affect their ability to be a full and equal participant in society.

B.6 The social model of disability starts from a different perspective. Instead of focussing on a person’s disability, it presupposes that everyone is equal and that society erects barriers that prevent disabled people participating and restrict their opportunities. In terms of access to rights of way, instead of asking: “*How do people’s disabilities or health problems prevent them from using rights of way?*“, the social model of disability would ask: “*What is it about public rights of way that makes it difficult for people with disabilities to use them?*“.

The Equality Act

B.7 For the purposes of this guidance it is important that anybody involved with the potential implementation or maintenance of structures on rights of way does not restrict their Equality Act considerations purely to, for instance, the effect on people in wheelchairs. A non-exhaustive list would also encompass ensuring that the needs of those with problems of: mobility, sight loss, learning difficulties, manual dexterity or physical coordination are considered and catered for. Within this context, gates that require excessive force to open, or have latches that are difficult to operate would fall within the ambit of the Equality Act.

B.8 The Equality Act 2010 requires (broadly) that in carrying out their functions, public authorities must make reasonable adjustments to ensure that a disabled person is not put at a substantial disadvantage in comparison with persons who are not disabled. But the Equality Act goes further than just requiring that a public authority does not discriminate against disabled persons. Section 149 imposes a duty, known as the “public sector equality duty”, on the public bodies (listed in Schedule 19 to the Act) to have due regard to three specified matters when exercising their functions. The three matters are:

- eliminating conduct that is prohibited by the Act;
- advancing equality of opportunity between people who have a disability and people who do not; and
- fostering good relations between people who have a disability and people who do not.

As well as the public bodies listed in Schedule 19, the section also imposes the public sector equality duty on others that exercise public functions, but only in respect of their public functions. Subsection (6) makes clear that complying with the duty might mean treating some people more favourably than others, where doing so is allowed by the Act. This includes treating people who have a disability more favourably than people who do not.

B.9 The discrimination provisions are subject to certain exceptions, which contain an element of reasonableness. The Government Equalities Office have produced a series of summary guides *Equality Act 2010: What do I need to know? The Equalities Act* and *Explanatory Notes* can be downloaded.

B.10 All of this applies only to functions within the authority’s powers and will not apply where a public authority is exercising a statutory power and has no discretion as to whether or how to exercise that power, or no discretion as to how to perform its duties, for example: adding an existing right of way with its existing limitations to the definitive map and statement.

Which individuals and bodies does the Equality Act apply to?

B.11 The Equality Act applies to a highway authority’s provision of public rights of way services.

3. Relevant Extracts from Guidance to Farmers and landowners on GOV.UK

Public safety

Farming activities can pose risks to the health and safety of you and your employees, and also to any contractors or visitors - including walkers, hikers and cyclists - that may come onto your land. Public safety should be a part of your overall health and safety policy.

If you carry out a risk assessment, you can minimise any risks to those on your land.

Rights of way

If you have people passing through on your land, you must minimise any risk of injury to them.

The Occupiers' Liability Act 1957 means that you must take care to make sure that any invited visitors onto your land are reasonably safe, and that there are adequate warnings of any danger. The Occupiers' Liability Act 1984 extends some protection rights to people you have not invited or allowed to be on your land, such as trespassers.

Your duty of care under the Occupiers' Liability Act 1957 does not apply towards people exercising Countryside and Rights of Way Act 2000 (CROW) access rights. [Find guidance about CROW rights on the Natural England website.](#)

Find more information in the guides on public rights of way and common land.

Livestock

If an animal injures somebody or causes damage, you may be liable under the Animals Act 1971. If you have fields that are accessible by the public and have livestock normally in them, you must make sure:

- that you do not keep bulls in fields with footpaths
- that if you keep beef stock bulls in such fields, that they are accompanied by female stock and you put up suitable warning signs
- that you assess the temperament of any cattle kept in fields with public access, and remove from the group any that may be aggressive

You can [download guidance on cattle and public access from the HSE website \(PDF, 89K\).](#)

4. Relevant extracts from *Managing Public Access: A Guide for Land managers*, CA 210 *The Countryside Agency in association with the CLA and NFU*

Chapter 11

Public safety and liability

Introduction

Deciding exactly what duty of care one person owes to another depends on the facts of the individual case. This chapter can be taken as a guide but you may need to seek legal

advice. It is important to be clear as to the type of public access on the land and the liability regime that governs it. This duty may have implications for public liability insurance, and all landowners are advised to have this type of insurance. Meeting the duty of care is a civil duty (ie. it governs whether you could be sued, for example by an injured person). Statutory duties could also arise under the Health and Safety at Work etc. Act 1974 and associated regulations, and such duties govern whether you could be prosecuted for any offence.

The Occupiers' Liability Act 1957

The Occupiers' Liability Act 1957 sets out the duty of care to people who come on to land by invitation of the owner or occupier or who are permitted to be there. The duty is to take care over the state of the land so that visitors (who could include children) will be reasonably safe in using it for the intended or permitted purposes. For example, farmers should take steps to protect visitors from hazards, such as slurry lagoons located close to access tracks or public rights of way. The 1957 Act provides that this duty does not impose any obligation on an owner or occupier to a visitor who willingly accepts risks. This is a statutory confirmation of the common law principle that a willing person cannot be injured in law. Climbers and mountain walkers, for example, voluntarily accept the risks of their sport or recreation. If a climber or hill walker is injured in a climbing accident any claim against the owner or occupier is likely to be defeated by the defence that the injured person willingly accepted the risks.

The Occupiers' Liability Act 1984

The Occupiers' Liability Act 1984 extends the duty of care to trespassers and others not invited onto the land, but only if three conditions are fulfilled:

- that the owner or occupier knows of dangers on his or her premises;
- that he or she knows or suspects that people might come near that danger;
- that the risk is one against which he or she might reasonably be expected to offer some protection.

Again, the duty of care does not apply towards a person who willingly accepts a risk. In addition, an owner or occupier may discharge the duty by warning of the danger and discouraging people from taking risks. Warning notices should indicate both the dangers and where the liability lies, for example: 'These quarries are dangerous. Persons who climb on them or go near them must accept risks of injury to themselves and others'.

The duty of care on CROW access land

The 1957 Act does not apply at all to people exercising access rights over CROW access land and the duty of care is in some respects lower than that owed to a trespasser under the 1984 Act. When the access rights are available (and no restrictions or exclusions are in force), the occupier has no duty of care towards users of CROW access land for risks arising from:

- natural features of the landscape or any river, stream, ditch, pond or tree;
- a person passing over, under or through any field boundary, except by proper use of a stile or gate.

These exemptions do not apply to any risk created deliberately or recklessly by the occupier. In addition, although the occupier could be sued by someone exercising their access rights on CROW access land in respect of injury or damage caused in other ways, the courts must take particularly into account, when assessing the extent of any duty owed under the 1984 Act, the following:

- the burden (financial or otherwise) on the occupier of doing more than he did;
- the importance of maintaining the character of the countryside (including features of historic or archaeological interest);
- relevant guidance from the Countryside Agency, such as the Countryside Code, which tells the public they are primarily responsible for their own safety when visiting the countryside.

Dedicating land as CROW access land (see page 10) provides reduced duty of care over the dedicated land.

Health and safety legislation

The Health and Safety at Work etc Act 1974 sets out the general duties that employers have towards employees and members of the public and employees have to themselves and to each other. These duties are qualified in the Act by the principle of 'so far as is reasonably practicable'. In other words, an employer does not have to take measures to avoid or reduce the risk if they are technically impossible or if the time, trouble or cost of the measures would be grossly disproportionate to the risk. The law simply requires good management and common sense, that is, assessment of the risks and undertaking sensible measures to tackle them.

The Management of Health and Safety at Work Regulations 1999 generally make the Act's requirements more explicit. Like the Act, they apply to every work activity. Their key requirements are that:

- employers and the self-employed have a duty to conduct their undertakings so as to avoid risks to employees, visitors and others (including volunteers and trespassers);

- a risk assessment is required;
- the risk assessment must be reviewed if circumstances change significantly;
- the risk assessment must be recorded in writing where the business employs five or more employees. Employers with fewer than five employees still have to do a risk assessment but do not need to record it – although this is still good practice.

Breach of these regulations is a criminal offence. Breaches of the Management of Health and Safety Regulations 1999 may also be indicative of a breach of the civil duty of care and, in the event of an accident, could result in civil claims for damages being lodged against the occupier by injured parties. In practice, most risks from business activities to members of the public enjoying their access rights are very small. But, by conducting a risk assessment and recording and periodically reviewing its findings, a land manager is likely to be complying with the law and be safe from prosecution and, in the event of being sued, able to provide an adequate defence. If a serious incident occurs as a result of land management activities, for example, one in which someone has to be taken to hospital, then the business operator is required by the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 to report the incident to the Health and Safety Executive. Many organisations have produced model risk assessments to help business operators work systematically through risks associated with their business activities. The NFU has a model risk assessment specifically designed for land managers that covers risks to members of the public. Risk assessments will highlight where measures may be needed to help reduce risks, such as through erecting signs. Signs might be used to warn of risks associated with, for example, slurry lagoons, buildings, farm machinery and some farming operations (eg. spraying of pesticides). The Countryside Agency has produced guidance on the use of signs on access land, including warning signs (see 'Further information' on page 69').

Animals Act 1971

The Animals Act 1971 makes the keeper of an animal 'strictly liable' in most cases for injuries caused by their stock. 'Strict liability' means that the keeper is responsible for such injuries even if it is not the keeper's fault. For example, if a gate is left open and stock escape on to a road, the keeper of the animal would probably be liable for damages if a road traffic accident occurred and injuries were sustained. If one of your animals injures someone or causes damage, you may be liable if:

- it was likely to cause that kind of injury or damage unless restrained; **or**
- any injury or damage it caused was likely to be severe; **and**
- the characteristics of the animal that made this likely are abnormal in that species, or are abnormal in the species except at particular times or in particular circumstances; **and**

- those characteristics were known to the owner or the person responsible for the animal.

There will be no liability where the damage or injury:

- was wholly the fault of the person suffering it;
- arose from a risk willingly accepted; or
- occurred to a trespasser.

Liability on defined routes

Where a highway is maintained at public expense, the highway authority has liability for users who are injured because the way is in disrepair. However, a highway authority could take action against a landowner or occupier who had created any source of danger on or near a highway or who had failed to keep back vegetation encroaching on a highway from the sides or above. Similarly, the landowner is likely to be held liable for injuries caused by a faulty or dangerous stile or gate, unless provided by the highway authority. On a privately-maintainable highway, or on a permitted (or 'permissive') path or toll ride, the landowner or occupier is responsible for the surface of the path and therefore could be held to be liable for any accident. Landowners who wish to establish permitted ('permissive') paths or toll rides should bear this responsibility in mind, and ensure they have appropriate insurance.