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Campaign for Responsible Rodenticide Use
CRRU Stewardship

Campaign for Responsible Rodenticide Use (CRRU) UK

The UK Rodenticide Stewardship Regime Report for the Government Oversight Group,

NOVEMBER 2016

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Report for the Government Oversight Group, 16th November 2016

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Foreword

The UK Rodenticide Stewardship Regime is the first scheme of its kind to be implemented on a national scale for the management of the potential environmental risks of a class of biocide – in this case the anticoagulant rodenticides. Although used for more than fifty years, these compounds fail conventional, hypothetical, environmental risk assessments now conducted by regulators in Europe. Their characteristics also mean that some of them are 'substances of concern' and 'candidates for substitution', which means that their uses will remain under close scrutiny by regulatory authorities.

The UK Competent Authority for biocides, the Health and Safety Executive (HSE), has decided that because there are no equally effective and safer methods of rodent pest management, and because their removal from the market would result in unacceptable risks to human and animal health, anticoagulants may continue to be authorised for sale and use. However, a scheme of stewardship must be implemented, on a voluntary basis, to reduce risks to the environment and to provide HSE with the confidence it requires to permit their continued authorisation.

The stewardship regime now in place is the result of more than three years of effort by numerous individuals and organisations; the names of many are given in this report. Our grateful thanks must go to them all for their patience, diligence and professionalism. All of them have given their time and energy freely to implement this complex enterprise, while busy carrying out their normal duties for the organisations they serve. The leaders of the six stewardship delivery work groups deserve special thanks.

As we report here, the UK Rodenticide Stewardship Regime is in place. We believe it will provide a robust system for controlling rodenticide availability and improving use practices. But it is still in its early stages and much remains to be done. We must continue to work to ensure that it delivers the outcomes that we all want to see. If it does, and we can show that these products can be used without unacceptable effects on the environment, the products will remain available for our use. If we cannot do so, then we must anticipate further restrictions on where rodenticides can be used and who can apply them.

Dr Alan Buckle

Chairman CRRU UK,
University of Reading.

4th November 2016

Summary of Progress

1. **The UK Rodenticide Stewardship Regime was in place when the first products with 'stewardship conditions' labels came to the market in April 2016. This was facilitated by the following actions by six CRRU UK stewardship implementation work groups:**
    i. The Best Practice Work Group (BPWG) published a code of best practice for rodent pest management in March 2015, upon which all training for certification is now based.
    ii. The Training and Certification WG (T&CWG) established a training framework, setting out necessary course syllabus content and required examination procedures. It has also conducted an audit, and published its results, to determine which existing certifications/qualifications meet CRRU UK requirements for approval.
    iii. The BP WG also co-ordinated a process wherein certain farm assurance schemes obtained CRRU UK-approved status by having in place structured and documented rodent pest management strategies. Approval means that, until December 2017, membership of an approved scheme is equivalent to a certification of competence.
    iv. The Regulatory WG, (RWG) in consultation with HSE, arranged an orderly and timely transition from the old scheme of rodenticide product regulation to the new scheme based on 'stewardship conditions' product labels.
    v. The Point of Sale WG (POSWG), following a study of the supply chain, put in place checks for competence at outlets which supply professional rodenticide products for use outdoors.
    vi. The Communications WG (CWG) co-ordinates a strategy of information dissemination in all rodenticide user sectors so that information on the stewardship regime is available to those who purchase and use professional rodenticides.
    vii. Prior to stewardship implementation, the Monitoring WG (MWG) carried out a Knowledge, Attitude and Practice (KAP) survey in all rodenticide user groups (professional pest controllers, local authorities, farmers and gamekeepers) to provide understanding of their competence and practices prior to the implementation of the regime. The WG also conducted baseline surveys of barn owls to examine the frequency and concentrations of rodenticide residues in their livers and to study annual breeding parameters in selected owl populations.
    viii. The BPWG has published further detailed guidance on permanent baiting and environmental risk assessment.

2. **The stewardship regime is in its early stages and further development is planned:**
    i. Discussion will take place with the Government Oversight Group (GOG) to determine the most cost-effective methods of monitoring the delivery and effects of the stewardship regime and for reporting them to the oversight group. Regular reports will be made by CRRU UK to the GOG.
    ii. The BPWG will work with farm assurance schemes to bring their standards into line with CRRU best practice guidance. Membership of schemes with aligned standards will continue to provide proof of competence at point of sale beyond the end of 2017.
    iii. The T&CWG will develop a framework for delivery of continuing professional development (CPD) in all user sectors.
    iv. The monitoring and reporting of compliance with point of sale checks will be the subject of immediate consideration and consultation by the CRRU UK Task Force and POSWG.
    v. The monitoring of barn owl liver residues and breeding parameters will be carried out annually. Periodic KAP surveys will take place to monitor changes in workforce competence and adoptions of best practice.

1. Background

The concept of a voluntary scheme of stewardship to mitigate risks to wildlife of the anticoagulant rodenticides was formalised following the meeting of HSE and stakeholders held at Crosby on 23rd April 2013. An HSE report, dated 9th August 2013, outlined the required elements of a stewardship scheme and the likely responsibilities of a co-ordinating 'stakeholder group'[1]. The Directors of CRRU UK had previously (in June 2013) declared the willingness of the organisation to act in this co-ordinating capacity.

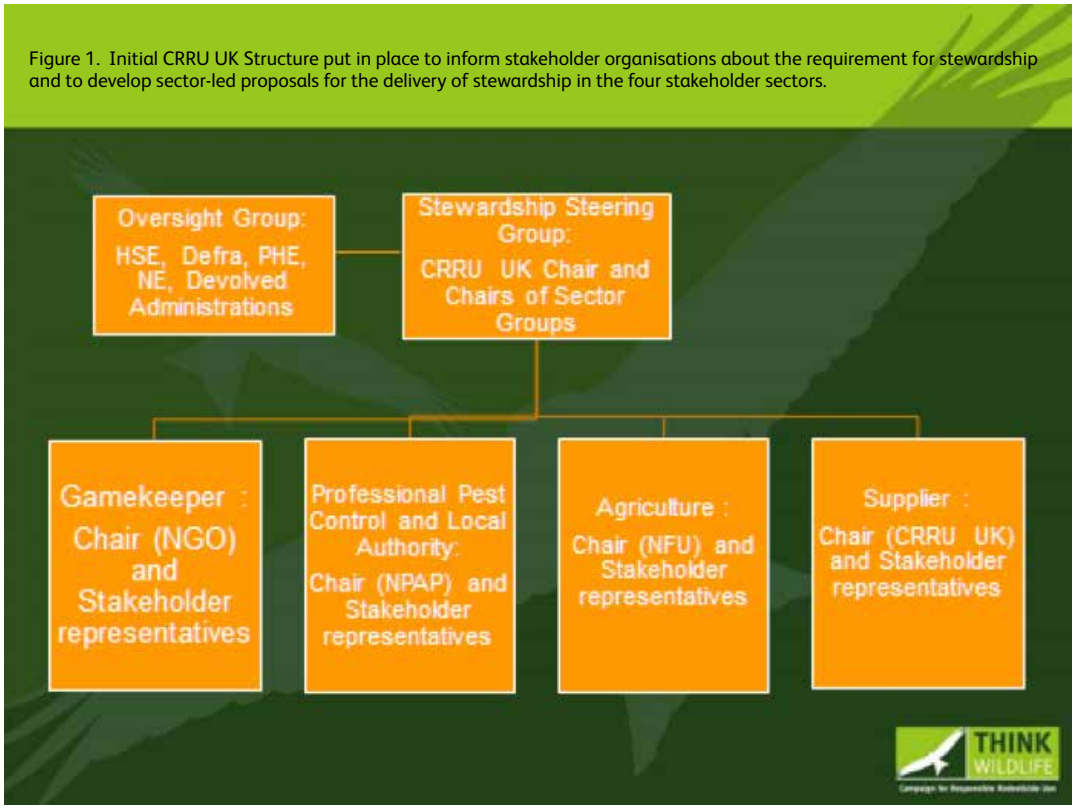
CRRU constituted four stewardship stakeholder Sector Groups, one comprising manufacturers/distributors, and the others each representing one of the main user constituencies, namely (1) professional pest control/local authorities, (2) farming and (3) game-keeping/estate management, with a steering group provided by CRRU (figure 1). CRRU made clear to these groups the reasons why stewardship was needed and the requirements of an effective stewardship scheme, as they were then understood. CRRU invited written proposals, for submission to HSE, from each of the groups on how stewardship would be delivered within their respective user sectors. It was considered that compliance was more likely if proposals came from users themselves, rather than being imposed by either CRRU or HSE. When their work concluded, these sector groups comprised representatives of more than thirty-five stakeholder organisations.

Initial proposals were tabled by CRRU on behalf of the sector groups on 18th February 2014.[2] These were considered inadequate by HSE and other involved government departments. Further proposals were put forward, respectively, in June and July 2014. A significant stumbling block remained throughout all three proposal iterations. This was the inability of the agriculture sector to accept the requirement for training and certification to permit purchase of professional rodenticide products only by those who could demonstrate competence by the possession of an appropriate training certificate. This unwillingness was caused by the very short time-line for the proposed implementation of point-of-sale competence screening and the very large, and effectively unmanageable, numbers of professionals in the farming sector that needed to be trained.

The issue remained unresolved until the summer of 2015 when a solution emerged, was consulted upon and was accepted by all stakeholders representing the farming sector, the CRRU UK Task Force and HSE. This was that, for an interim period, membership of a farm assurance scheme that included in its standard comprehensive elements of rodent pest management should serve as proof of competence at point-of-sale. Further work with farm assurance schemes is presently ongoing to see if this arrangement can be made permanent.

A Government Oversight Group (GOG) was established comprising representatives of HSE, Natural England (NE), Public Health England (PHE), the Devolved Administrations and other invited specialists as necessary. Throughout the process of development and implementation of the

Figure 1. Initial CRRU UK Structure put in place to inform stakeholder organisations about the requirement for stewardship and to develop sector-led proposals for the delivery of stewardship in the four stakeholder sectors.



[1] Health and Safety Executive (2013). Second Generation Anticoagulant Rodenticides (SGARs) Development of a Stewardship Regime. Document 2013/0298865. 09.08.13. 10 pp.

[2] CRRU UK (2014). UK Second-generation Anticoagulant Rodenticides (SGARs) Stewardship Regime Proposals. February 2014. 44 pp.

stewardship regime HSE provided a series of documents for guidance on current government thinking on stewardship requirements, and on the regulatory process that was continuing in parallel:

- January 2015, HSE published guidance on the relationship between the development and implementation of the stewardship regime and the regulatory framework that it was intended to support.[3]
- July 2015, HSE published its proposed framework for the implementation of a rodenticide stewardship scheme in the UK and the 'high level principles' that such a scheme should meet.[4] The intended implementation by CRRU of the "UK Rodenticide Stewardship Regime", covering all user sectors and all anticoagulant active substances, gave HSE sufficient confidence that the environmental risks posed by outdoor use of these biocides might be sufficiently addressed to permit their authorisation.
- January/March 2016, HSE provided additional guidance for CRRU about general requirements for monitoring the effects of the implementation of the stewardship regime.[5] Additional information was also provided on aspects of monitoring in relation to wildlife exposure.[6]

The following sections of this report provide information on stewardship regime implementation and on the various projects, initiated by CRRU UK at its expense, to monitor the effects on the regime in the following subject area and with links (in brackets) to the HSE 'High Level Principles'.[4]

- Environmental Impacts (Monitoring Compliance)
- Whether the rodenticides are effective (Competent Workforce)
- Resistance monitoring (Competent Workforce).
- Awareness using the Knowledge, Attitude and Practice (KAP) survey (Competent Workforce/ Monitoring Compliance)
- Point of sale information (Supply Chain Governance)
- Training (Competent Workforce)

3. Health and Safety Executive (2015a). UK Anticoagulant rodenticide product authorisation and the CRRU Stewardship scheme. Information document January 2015. 12 pp.
4. Health and Safety Executive (2015b). Government agrees high level principles for rodenticides stewardship regimes. Available at: http://press.hse.gov.uk/2015/government-agrees-high-level-principles-for-rodenticides-stewardship-regimes/. Date accessed 19.10.16
5. Health and Safety Executive (2016a). Performance Monitoring and Assurance: Rodenticide Stewardship Regime. March 2016. 3 pp.
6. Health and Safety Executive (2016b). Rodenticide Stewardship Regime. Government Oversight Group (GOG): Monitoring the potential impact on wildlife. Official –Sensitive: Policy development: Draft January 2016. 3 pp.

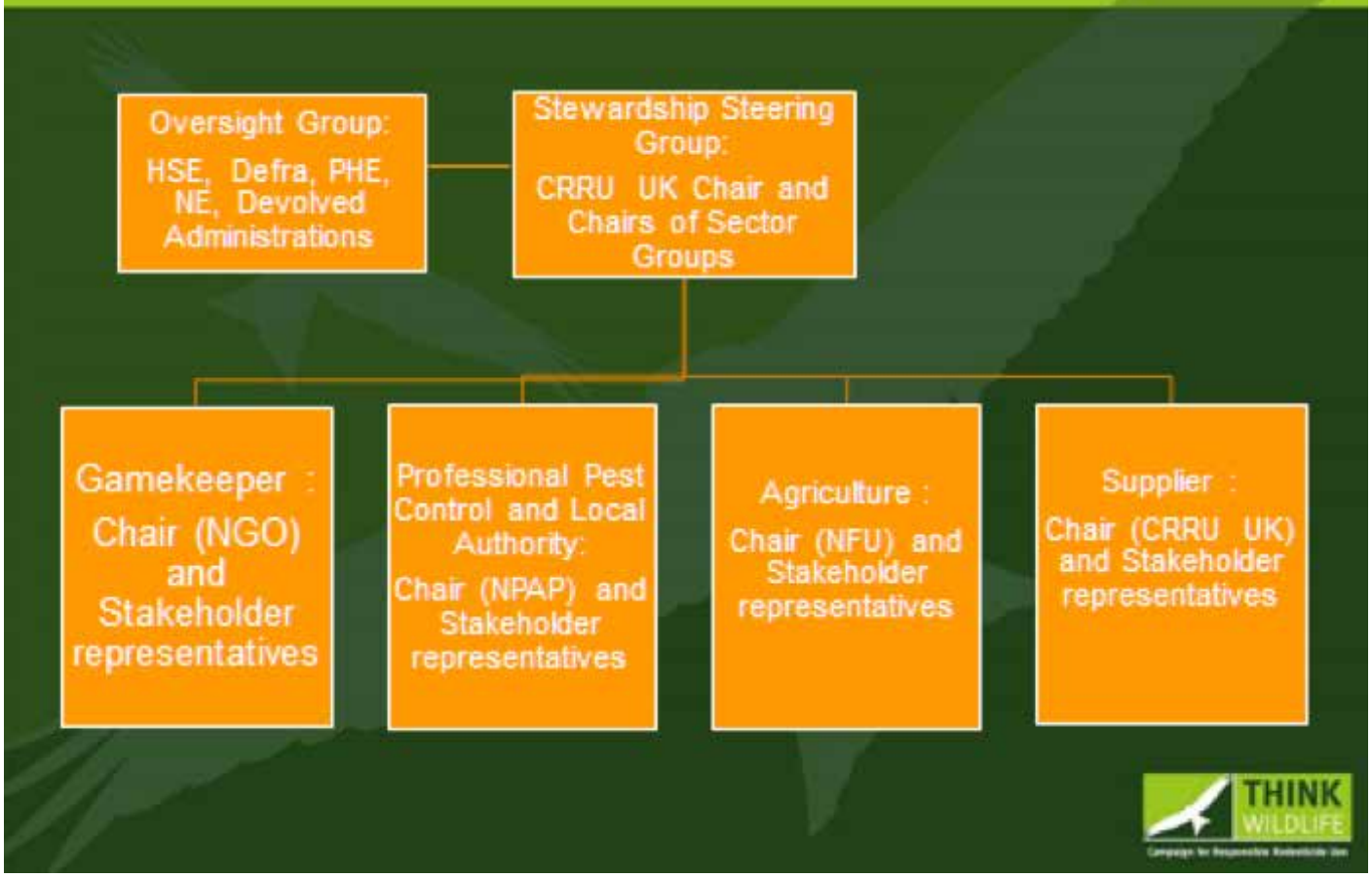
2. Implementation of the Stewardship Regime

CRRU shut down the sector groups (figure 1), which had been invaluable in the development of proposals, and established a new framework of six Work Groups to implement the regime, each with a work group leader nominated from within the group (figure 2). [7] Work groups are populated by people recruited from any stakeholder organisation declaring a legitimate interest and having appropriate expertise. In this case the steering group comprises the entire CRRU UK Task Force, currently involving thirty-three agencies. Thereby, all stakeholders are consulted in all matters relating to stewardship implementation. The Task Force is itself guided by a panel of technical experts from government and academia.

The workload of stewardship implementation is, therefore, equitably distributed among manufacturers, distributors and user representatives, so that it falls disproportionately on none. All funding for stewardship implementation comes from annual subscriptions provided by authorisation holders, who also provide the CRRU UK Board of Directors. Those operating the work groups are shown at Annex 1.

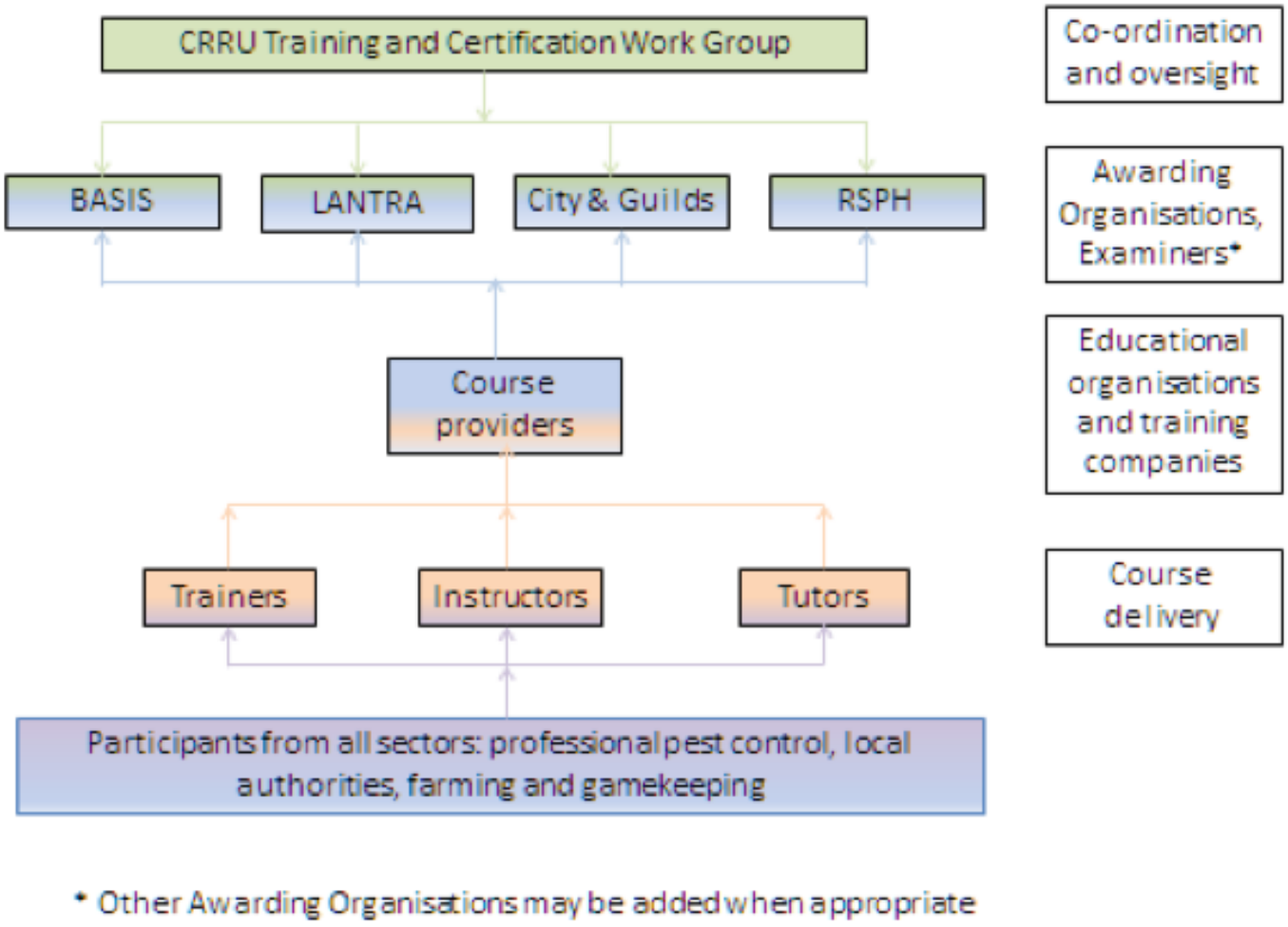
An essential implementation step is that HSE makes it clear to all applicants for authorisation of a product containing an anticoagulant active substance, to be applied outdoors by professionals, that participation in a stewardship scheme which meets the high level principles is a prerequisite to the grant of authorisation. Up to now, only the CRRU UK Rodenticide Stewardship Regime is considered by HSE to meet these requirements.

Figure 2. Structure established by CRRU UK to implement of the UK Rodenticide Stewardship Regime and to monitor its effects.



7. CRRU UK (2015). Outline of CRRU Structure to deliver co-ordination of UK Rodenticide Stewardship Regime. Version 14.08.15. 9 pp.

Figure 3. Structure for delivery of approved training and the organisations involved.



3. Report on Progress of Stewardship Implementation

3.1 General

The following sections provide information on the current status of delivery of the stewardship regime and some of the future actions planned. They have been compiled from reports provided by the respective work groups, through the work group leaders. This permits examination of the broad spectrum of work undertaken by these groups, each with unique objectives and an essential part to play in the delivery of stewardship.

Presently, there is some unresolved duplication among work groups in the use of data from the Knowledge, Attitude and Practice (KAP) survey.[8] For example, the numbers of respondents in the KAP survey who reported holding an approved certification is a metric relevant to the achievements of both the Best Practice and Training and Certification WGs. A decision was made that this initial report should provide a wide range of available information and comment, with the purpose of providing insight into the current state of establishment of the stewardship regime and the robustness of its provisions.

CRRU UK invites guidance from the GOG about what metrics are more, or less, important for future reports to ensure that oversight is conducted effectively and without wasted resource. It may be preferable, for example, that future reports should be structured around the required data headings proposed by HSE[5] as follows (rather than reports from the different work groups):

- Knowledge, Attitude and Practice (KAP) survey
- Data on secondary poisoning
- Data from CRRU Point of Sales Monitoring
- Training
- Data on rodenticide resistance

8. CRRU UK (2015). Rodenticide Knowledge, Attitudes and Practices: Baseline Survey: August 2015. Independent Survey conducted by iQube Marketing Ltd., Reading, UK. 86 pp.

3.2 Work Group 1. Best Practice (Leader: Dee Ward-Thomson, BPCA)

3.2.1 Representatives, meetings held and objectives

The workgroup has representatives from all main user stakeholder organisations and from a number of specialists provided by manufacturers and authorisation holders (Annex 1). The meetings of the group are shown (Annex 2) but there has also been extensive consultation with all of the main farm assurance schemes in order to bring their standards into alignment with the CRRU UK Code of Best Practice. [9]

The Best Practice Work Group has the objective to ensure that all users of SGARs, within the UK SGAR Stewardship Regime, are aware of and apply the CRRU Code of Best Practice. The WG seeks to report the operations of stakeholder organisations when they monitor and audit the compliance of their members with the Code of Best Practice ("self- policing").

The WG is also the principal point of contact with the farm assurance schemes so that membership of them provides, and may continue to provide, proof of competence at point of sale.

In particular, the work group has requirements to ensure that the guideline is adopted by:

- Professional pest control trade associations and other advisory bodies for the professional pest control sector.
- Accreditation schemes operating in the food and retail sectors and their auditing procedures.
- Game-keeping trade associations and other associated organisations.
- Agricultural accreditation schemes and their farm auditing procedures.
- Agriculture sector Levy Bodies and other organisations offering advice to farmers about rodent control.
- Agencies offering training, qualification and certification to professional users of rodenticides.

3.2.2 Output and achievements

CRRU UK Code of Best Practice[9]

The code of best practice was constructed based on current knowledge of safe and effective use of rodent pest management techniques, concepts of risk mitigation developing as a result of the implementation of the Biocidal Products Regulation, and with consideration to the two HSE guidance documents, one for professional pest controllers and one for farmers, which preceded it. It was finalised and published after a process of consultation with all user stakeholder groups and HSE.

The code has been downloaded from the CRRU website a total of 8,017 times and 11,000 copies have been printed and disseminated.

*Membership of Farm Assurance Schemes as proof of competence at point of sale*A major stumbling block in the implementation of a comprehensive stewardship regime across all rodenticide user sectors was the difficulty presented by a requirement for proof of competence at point of sale in the agriculture sector (see section 1). The decision to allow membership of a farm assurance scheme (FAS) to provide certification for an interim period, up to 31st December 2017, was implemented through an approval procedure operated by the BPWG.

Scheme assessment process – interim approval

Interim approval was based on an assessment by the BPWG that the candidate scheme's standards exhibit three key attributes in relation to rodent pest management:

- Structured approach. This should include proposals for implementation of a range of interventions, including requirements for proofing and good-housekeeping. The general approach should be through an integrated pest management system.
- Documented. There should be clear requirements for record-keeping in all aspects of the scheme.
- Regular auditing. Members' compliance with the scheme's standard should be assessed on a regular basis via an independent auditing process. A degree of (more frequent) self-auditing was supported.

Farm assurance schemes given interim approval

The following table shows the FASs that have been assessed, and agreed unanimously by the members of the BPWG, to exhibit the attributes needed for interim approval and whose members will be permitted to use membership documents as proof of professional competence until 31st December 2017. The BPWG is now updating its records on membership numbers. The members of the majority of these schemes are independently audited for compliance with standards at a frequency of at least once every 18 months.

9. CRRU UK (2015). CRRU UK Code of Best Practice – Best Practice and Guidance for Rodent Control and the Safe Use of Rodenticides, March 2015, 24 pages. Available at: http://www.thinkwildlife.org/crru-downloads/crru-uk-code-of-best-practice/?wpdmdl=3220. Date accessed: 27.10.16

Assurance schemes	No. of members	Geographical Coverage
Agricultural industries confederation	250	UK
Red Tractor Farm Assurance - Beef and Lamb	24,909	England
Red Tractor Farm Assurance - Dairy	11,435	UK
Red Tractor Farm Assurance - Crops	17,928	England, Wales
Red Tractor Farm Assurance - Fresh Produce	2,470	UK
Red Tractor Farm Assurance - Pigs	2,059	England, Wales, NI
Red Tractor Farm Assurance - Poultry	1,860	UK
Quality Meat Scotland - Beef & Lamb	9,812	Scotland.
Quality Meat Scotland - Pigs	114	Scotland
Farm Assured Welsh Livestock - Beef & Lamb	7,500	Wales
Scottish Quality Crops	3,500	Scotland
Northern Ireland Farm Quality Assurance Scheme - Beef and Lamb	11,726	NI
Northern Ireland Farm Quality Assurance Cereals Scheme	915	NI
"Laid in Britain"	27 95,505	England, Wales, Scotland
TOTAL	95,505	

Procedure of FAS approval after 31st December 2017

The initial priority of the BPWG was to decide and implement a process for interim approval of the standards of FASs. However, a procedure was required by which to determine possible approval beyond the initial interim period. This has been developed by the work group based on a point-by-point examination of schemes' standard in relation to approved rodent pest management procedures and the application of a 'mapping tool' (Annex 3).

The mapping process is to assess the alignment of the schemes' standard with the CRRU UK Code of Best Practice. The process of mapping is conducted in consultation with the candidate FASs and is led by a nominated member of the BPWG. If at its next issuance, and in any case before December 2017, a scheme's standard will meet the requirements of the BPWG, an agreement is reached with the scheme that its members will continue to be considered competent to purchase professional rodenticide products after 31st December 2017.This has taken much of the group's time during 2016 and involved many meetings to support assurance schemes through the process. There are currently three schemes that are now in the next stage (i.e. standard approval). The WG still has other schemes that are either working on their own in the mapping process, or who have not made any contact with the BPWG and, therefore, are at risk that they will not meet the December 2017 deadline to show that they meet the required standard.

Permanent (or Long-Term) Baiting

The group has written, consulted upon and published a document about the practice of permanent baiting. This document sets out the risks of this practice, recommends that it should not be a measure that is routinely implemented within rodent pest management regimes, explains how it might occasionally be justified and who might be permitted to use it and gives detailed advice on how to conduct long-term baiting when it is reasonable to do so.[10]

Environmental Risk Assessment

Work has taken place to review and develop new Environmental Risk Assessment documents (a guidance document and a form). This work is now completed and the new CRRU UK ERA has been released from the CRRU UK website.[11] This requirement was due to feedback given to the BPWG that the old CRRU UK ERA was not fit for purpose. The group is working on an electronic version of the ERA to make it simpler for the end user on-site and without paper.

Monitoring data

The group has begun to gather the data to demonstrate "self-policing". A delay in starting this project is due to the amount of work that has taken place involving the assurance schemes. As a start point the BPWG is gathering information on size of membership of each trade association and has asked them to report how they monitor among members compliance with the CRRU UK Code of Best Practice and with other necessary codes/standards. Progress so far:

10. CRRU UK (2016). CRRU Guidance Permanent Baiting. April 2016. 8pp. Available at: http://www.thinkwildlife.org/downloads_resources/. Date accessed: 03.11.16.
11. CRRU UK (2016). CRRU Environmental Risk Assessment. October 2016. 10 pp. Available at: http://www.thinkwildlife.org/downloads_resources/. Date accessed: 03.11.16.

BPCA (British Pest Control Association)

British Pest Control Association is the largest trade association for pest control, providing support and a voice within the sector to over 650 members and 6000 affiliates.

The BPCA currently has 448 servicing pest management companies within full membership, representing 3,809 employees. All BPCA members are currently independently audited to the European Pest Management Standard EN16636 as part of BPCA membership criteria, with the added choice of becoming CEPA® certified by the certifying body 'Bureau Veritas'. 55 BPCA members are currently CEPA® certified within the UK. The audit takes on average a day for completion for a small to medium company and covers both back-of-house and a field audit, and is performed on a rolling 18-month cycle. This standard covers every element of pest management and focuses on the environmental risk impact of pesticides. In addition to the audit requirement, all Members have to abide by all of the BPCA codes of conduct, which include the CRRU Code of Best Practice as a membership criterion. All BPCA members must be qualified to the BPCA/RSPH level 2 in Pest Management (Annex 5), as a minimum, and be on a current Continuing Professionals Development (CPD) scheme.

NPTA (National Pest Technicians Association)

The NPTA has 1,016 Members, representing approximately 2,500 pest control technicians. Last year, the NPTA required all Members to acknowledge, in writing, that they had read the CRRU Code of Best Practice on Rodent Control and agreed to abide by it. Only two declined to do this, citing anomalies that they perceived in the code, which have subsequently been raised with CRRU. At the moment their Membership of the NPTA is suspended. All new Members are required to sign this document.

For the last 3 years, the Stewardship Regime has been a key topic at NPTA's annual Conference and Exhibition, Pest Tech, which is attended by approximately 1,200 pest controllers each year. There have been numerous articles in the NPTA magazine 'Today's Technician', on this subject during this period. The topic has also been presented at NPTA "Training Days", which take place around the UK. This year NPTA ran nine such events, attended by 540 delegates, at venues throughout England, Scotland and Northern Ireland. The Association asserts that every one of its members is aware of the requirements of the Stewardship Regime.

In addition, 64 NPTA Members are part of an elite group that is audited on a regular basis. These are 'Accredited Members'. NPTA encourages all Members to join a CPD scheme, such as BASIS PROMPT. All NPTA events carry CPD points when appropriate and are audited by an independent agency (BASIS Registration Ltd.). NPTA is currently considering ways further to encourage uptake of this scheme with our Members.

CIEH (The Chartered Institute of Environmental Health)

The Chartered Institute of Environmental Health National Pest Advisory Panel (CIEH NPAP) is currently drafting a monitoring compliance questionnaire, together with a field audit template, for use by local authorities throughout the UK with in-house pest control services. The Questionnaire returns and data generated will be collated by CIEH NPAP and subsequently sent to CRRU UK on an annual basis to demonstrate compliance with best practice guidance.

3.2.3 Best Practice Key Performance Indicators from the KAP Survey

The KAP Baseline Survey (section 3.6) provides detailed information on how rodenticides are used by practitioners in all user sectors the UK. A sample of farmers (both livestock and arable), gamekeepers and pest controllers was asked a number of questions to gain insight into their knowledge, attitudes and practices, during May/June 2015. This took place prior to the implementation of the stewardship regime and before the wide dissemination of the CRRU Code of Best Practice on rodenticide use. It is the intention of CRRU UK to repeat the KAP survey at intervals to see if knowledge has improved and hopefully, to find that attitudes and practices have changed as a result, to reduce the adverse impact of anticoagulant rodenticides in the environment.

In consultation with the Monitoring Work Group (see section 3.6 and Annex 6), the BPWG is to conduct a project to extract important information from the KAP survey about adoption of best practice to permit CRRU UK to measure improvements brought about by the implementation of the stewardship regime.

3.2.4 Key next steps

The CRRU Best Practice Work Group will continue to provide support to the assurance schemes and approve those submitted to the group ready for the end-2017 deadline. This is a large project and is taking the most of the group's time. The aim is to ensure that, before the deadline, all of the schemes currently approved will have changed their standards to become fully aligned with the requirements of the CRRU Code of Best Practice and have them implemented ready for the deadline.

The other key tasks are to collate the numbers of members that are covered by all of the various stakeholder organisations with which the WG is engaged, to work with those agencies on the monitoring stewardship implementation and finalise a set of KPIs that will be used for benchmarking over the coming years.

3.3 Work Group 2. Training and Certification (Leader: Matthew Davies, Killgerm Chemicals)

3.3.1 Representatives, meetings held and objectives

The Training and Certification Work Group (T&CWG) is fundamental to the establishment of a competent workforce and its certification, permitting point of sale checks for competence. The WG comprises 26 representatives from 19 stakeholder organisations (Annex 1). The WG has held 16 formal meetings, either in person or on-line, and numerous other less formal discussions and consultations.

The principal objective of the WG has been to establish a 'Training Framework' (Annex 4) and to agree a training standard considered appropriate for proof of professional competence at point of sale, permitting purchase of professional use stewardship-labelled rodenticides. It has agreed key subject areas for courses designed to meet the standard which it sets. It has also commissioned a panel of organisations to be Awarding Organisations (AOs), and in co-operation with them, ensured that training and certification meet the requirements set out in the framework document.

In conjunction with the AOs and other stakeholders, the WG established and maintains a list of CRRU-approved certifications/qualifications that are considered appropriate for proof of professional competence at point-of-sale to permit purchase and use of professional use rodenticide products with stewardship labels (Annex 5). The WG is responsible for monitoring training delivery, maintenance of registers of qualified personnel by AOs and for the provision of a list of approved certifications/qualifications to the Point-of-Sale Working Group.

An important role of the WG was to establish which certifications/qualifications currently held within the different user sectors meet the appropriate standard – a so-called 'grandfathering' process. Where these were considered to meet the standard set, a procedure for updating the current learning of certification-holders will need to be considered (see section 3.3.4).

The WG will also consider what systems of Continuing Professional Development (CPD) are appropriate to the different user groups and take necessary action to ensure that they are implemented.

The WG procedure for approving certifications/qualifications was for relevant AOs and training providers to map syllabus content to the agreed subject areas listed in the training framework, check that other requirements of the framework were met (such as examination procedures), then seek unanimous approval from members of the group, following a consultation and feedback period, eventually leading to publication on the approved list on the CRRU website.

The WG comprises the main WG and two sub-groups, one responsible for the implementation of continuing professional development (CPD) with the following remit:

- A coherent framework of continuous professional development (CPD) will be developed for all user groups. These CPD registers will be operated for each user group by relevant bodies and organisations.

A second sub-group comprises representatives from the AOs, with the following remit:

- The high-level principles that underpin the stewardship regime place a responsibility on the Government Oversight Group (GOG) to monitor performance in delivering the agreed outcomes for regime. The sub-group will focus on providing information on Training (Competent Workforce), with the performance indicator 'the uptake of training by sector'. The AOs will submit data to GOG in a confidential procedure via the Leader of the Monitoring Work Group.

3.3.2 Work output

The main output and achievement of the WG has been to deliver its stewardship objectives and Training Framework, by producing approved training and certification options for users, in all user sectors as listed on the CRRU website http://www.thinkwildlife.org/list-of-training-and-certification/ and at Annex 5. This framework (Annex 4) sets out the structure and responsibilities all the organisations involved in training, the necessary course content for a course syllabus to be approved by the T&CWG and the nature of the examination procedure applied. The overall structure for the delivery of approved training is shown in figure 3.

AO logos are included on the training and certification section of the CRRU website and these direct potential delegates to the website of each AO for further information. Users find training providers via the hyperlinks associated with each currently available certification option. Also included are Frequently Asked Questions (FAQ) for users who need to make sure they either hold, or will be taking, approved training and certification options. It is important to note that approved training and certification options are numerous, affordable, accessible, relevant to the different user groups/sectors and also include online options, therefore being available to all.

3.3.3 Key monitoring metrics

Metrics used for monitoring competence and training implementation will be obtained from two sources, 1) those provided by the AOs concerning courses, course participants and certificate awarded and 2) measures made during the periodic operation of independent knowledge, attitude and practice (KAP) surveys (see section 3.6).

Data from Awarding organisations

The WG has worked with the AOs to produce data on the uptake of training and certification in each of the three main user sectors. These data are considered confidential to the four organisations, RSPH, LANTRA, City and Guilds and BASIS, which have supplied them. They comprise information on the number of training providers who present approved courses, the number of participants who obtain the certification and, in the case of LANTRA, City and Guilds and BASIS the pass rate of those who sit the examination.

These confidential data are presented to the oversight group separately from this report.

Metrics from the KAP Survey

The KAP survey was conducted in May/June 2015, and published in August that year, to provide baseline information on a number of key parameters including training and certification, prior to stewardship implementation. Two areas of information are extracted showing, respectively indicators of training and certification uptake (figures 4 and 5) and CPD participation (figure 5).

Figure 3. Structure for delivery of approved training and the organisations involved.

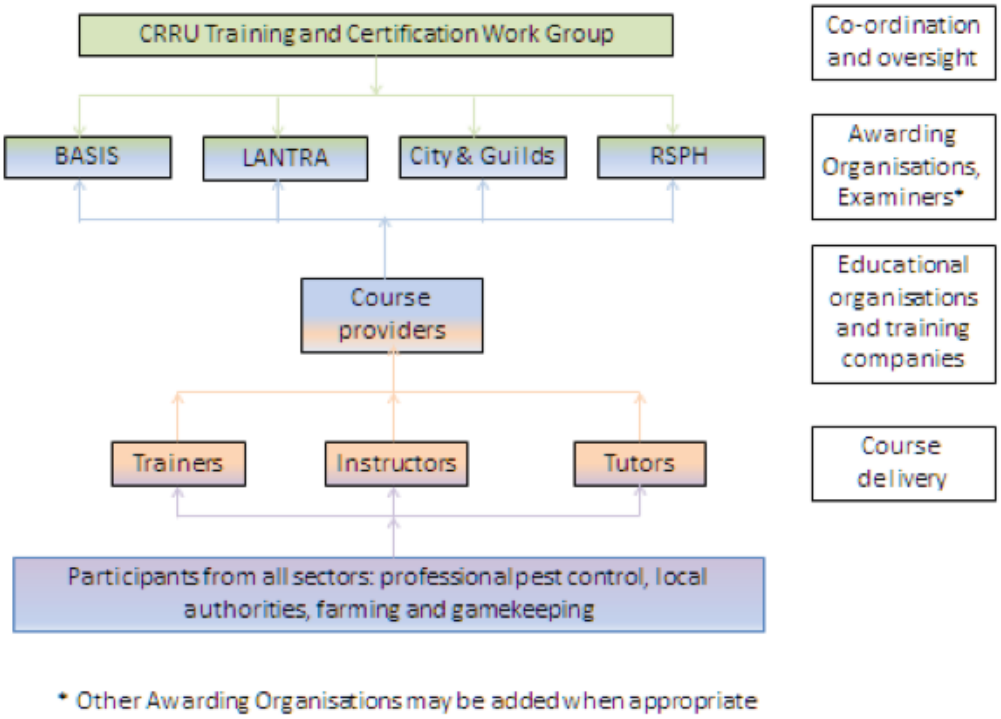


Figure 4. KAP baseline survey May/June 2015. Responses from the different user groups to the question: "Do you have a formal qualification relating wholly or in part to decisions about rodenticide usage or the application of rodenticides?". See section xxxx for numbers of respondents by sector.

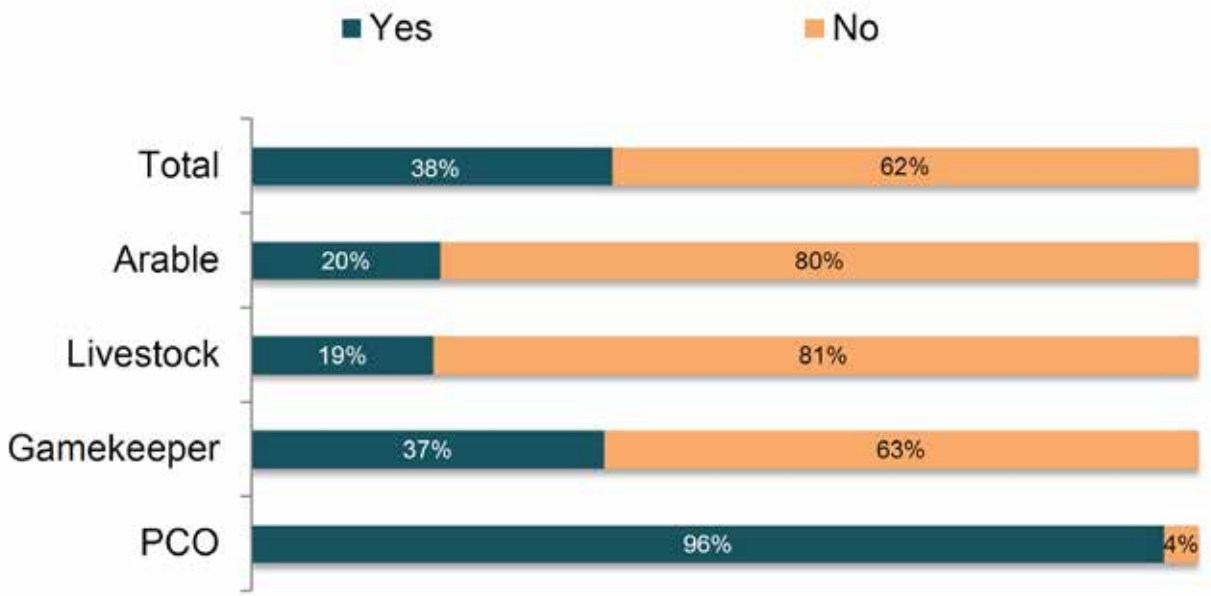
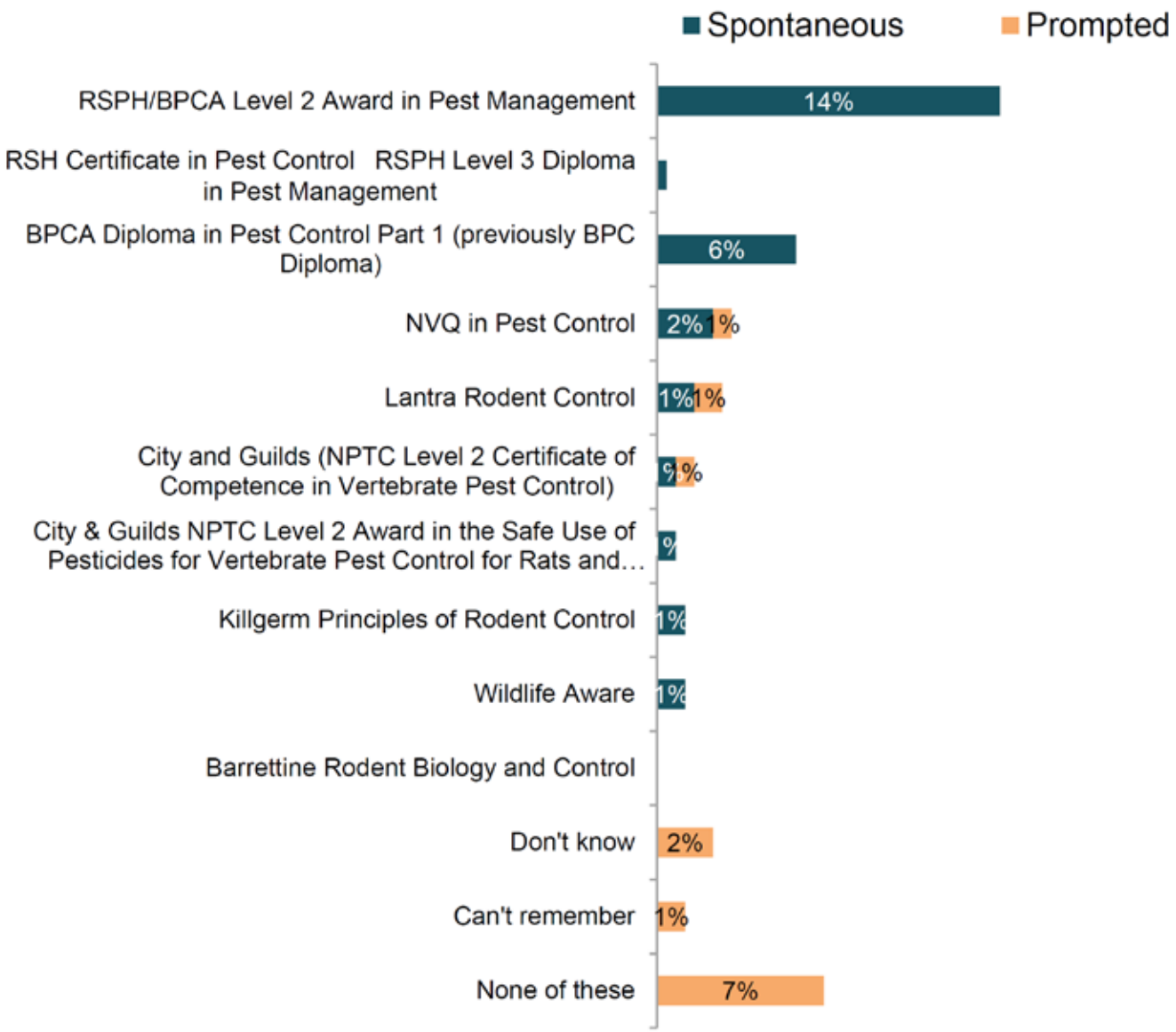


Figure 5. KAP baseline survey May/June 2015. Responses to the question: "What qualification do you hold that is directly related to deciding on rodenticide usage or using rodenticides?". Total number of respondents 268.



The possession of a relevant certification is, as might be expected, high in the professional pest control sector and leaves little room for improvement as the result of stewardship implementation. Overall 20 % of farmers reported that they had a qualification related to rodent control. However, there was high variation between farming types, particularly in the livestock segments, with only 3 % of dairy farmers holding a qualification compared with 50 % of poultry farmers. It is important to bear in mind that an alternative form of certification is provided for farming by membership of an approved farm assurance scheme (see section 3.1).

About 40 % of gamekeepers reported possession of a relevant training certificate. But this figure will increase sharply given the number of gamekeepers who have already obtained the certificate specific to them provided by BASIS, as a result of training from the main gamekeeping stakeholder organisations (see confidential information.)

Figure 5 shows the percentage of all the respondents with each type of qualification. If respondents could not name spontaneously the qualification they possess they were then read out a list (shown in figure 5). Once again the professional pest control sector accounted for the majority of the qualifications held. The most commonly held qualification was the RSPH/BPCA Level 2 Award in Pest management; 60 % of all the PCOs interviewed had it. A quarter of all PCOs had the BPCA Diploma in Pest Control Part 1. Of those in agriculture who said that they had a qualification, the majority did not remember what is was and, when prompted, said it was none of the listed qualifications.

3.3.4 Continuing Professional Development

Delivering a coherent framework of continuing professional development (CPD) for all user groups is the next key step in the delivery of stewardship within the remit of the T&C WG. The following two actions have been agreed with the T&C WG CPD sub-group and the CRRU TF towards the roll-out of a comprehensive CPD system. Implementation will begin in 2017:

1. <u>CPD route 1.</u> CRRU will produce an annual update regarding rodent control and stewardship, as they are best placed to inform user upon developments in the stewardship regime that will influence best practice and responsible rodenticide use. The CRRU update will contain content based around developments in stewardship, the 13 key subject areas in the Training Framework document and elements of the CRRU Code of Best Practice for Rodent Control (where applicable), with the content framed by learning outcomes. This update will be made available to all established CPD schemes, such as NRoSO (City & Guilds / NPTC), BASIS schemes (e.g. PROMPT, Professional Register), LANTRA, PIPR and alternative in-house schemes such as those in the professional pest control sector. The CRRU update will then filter through to trainers and end-users via these established CPD schemes and will provide the necessary rodent control element for such schemes. The CRRU update will be assigned a value by having an associated allocation of CPD points/time as well as being verifiable, recordable and quantifiable (numbers of participants), via systems currently employed by the established CPD schemes.

2. <u>CPD route 2.</u> Many users will fall outside of established CPD schemes but will still need to maintain their knowledge of the safe use of rodenticides to stewardship regime standards, having achieved the agreed levels of competence via approved certification and compliance with relevant farm assurance schemes. An example is those in the Gamekeeping sector, where no current CPD scheme exists. A 'CRRU portal' is proposed, as an alternative and/or a complement to established CPD routes and it would be an online resource to deliver the aforementioned CRRU update. A similar successful scheme is already in existence, which is that used by Farming Weekly Interactive (FWI) and it could be used as a model for the 'CRRU portal'. Users would retrieve the CRRU update from the CRRU portal, answer a series of questions to test their understanding then receive an electronic certificate or acknowledgement of completion. The suggestion is that the numbers of participants via this route would be recorded, as a way of quantifying uptake. This resource would also be available for those in established CPD schemes, sitting alongside CPD route 1 and completion of the update would count towards the contribution required to remain as a member of the established schemes. Route 1 would be useful for those who prefer a face-to-face update. It is simply a case of different delivery methods.

Some current information on CPD coverage was also provided by the baseline KAP survey (figure 6).

3.3.5 Issues that impact the work of the T&C WG

There are currently no outstanding significant issues known to the T&CWG that are expected to impact on future output and delivery of stewardship. Confidentiality concerns raised by AOs regarding their training and certification data being made available to GOG and the leader of the T&CWG have been addressed successfully. This was achieved by agreeing that Colin Prescott as an independent (Lead of the CRRU UK Monitoring work group / University of Reading) would collect and collate this data with oversight from Alan Buckle

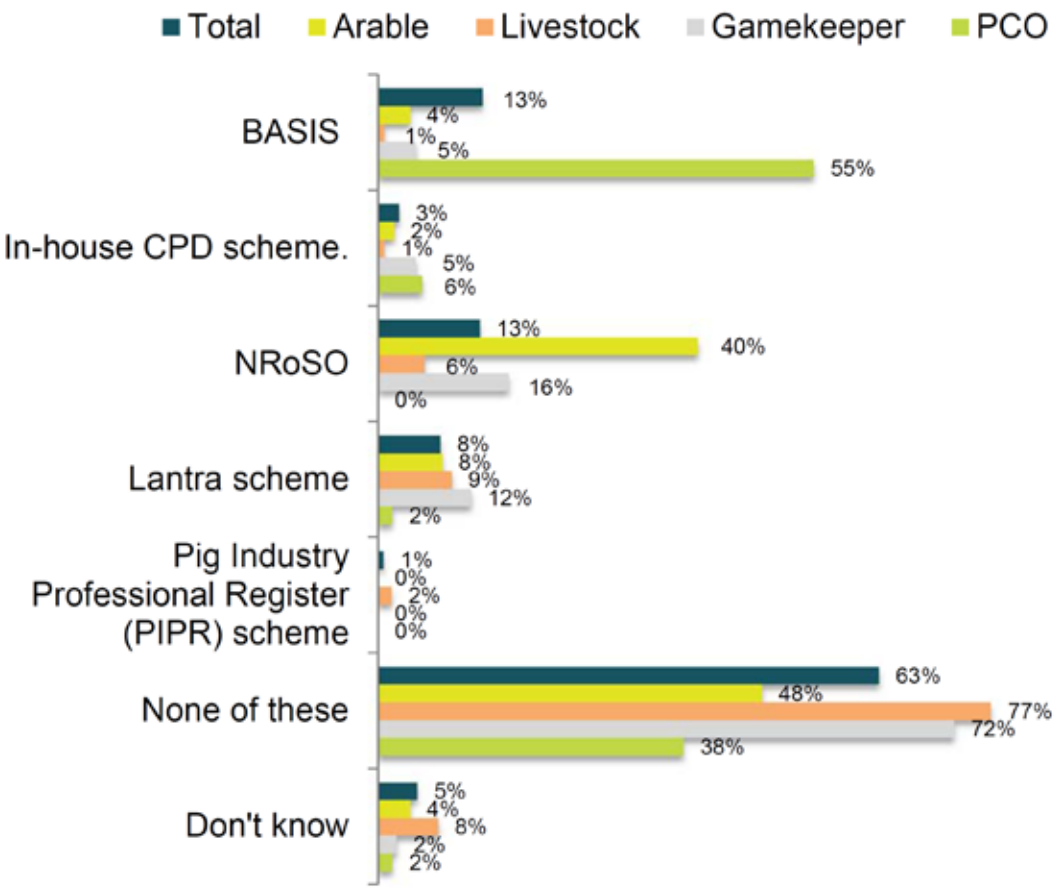
(Chair of CRRU UK) and communicate to GOG confidentially, separately from this report.

3.3.6 Future work

The T&CWG will continue with arrangements for data submission to GOG with the help of the Awarding Organisations. Further data will also be obtained regarding the numbers of historical approved certifications and qualifications issued, again with help from the Awarding Organisations.

The T&CWG will continue with delivery of training and certification in its current form.

Figure 6. KAP baseline survey May/June 2015. Responses to the question: "Which of these CPD schemes are you part of?" Total number of respondents 268



3.4 Work Group 3. Regulatory (Leader: Sarah Bull, BASF)

3.4.1 Representatives, meetings held and objectives

The Regulatory WG (RWG) comprises 13 representatives from 11 different stakeholder organisations (see Annex 1). A total of nine formal meetings have been held, including two meetings with HSE, as well as numerous informal discussions and consultations (Annex 2).

The objectives of the WG are to work towards harmonisation and simplification of product labels to permit all appropriate risk mitigation measures to be understood and applied by all user groups and to provide stewardship monitoring data to HSE (as required by the UK rodenticide stewardship regime).

3.4.2 Output and achievements

Application process and fees

The initial priority of the RWG was to facilitate a smooth and cost-effective application process for the authorisation of rodenticides under the stewardship regime. This was achieved by raising and discussing our concerns with the HSE and agreeing solutions. For example, the functionality of the electronic application system R4BP3.2 and the time-consuming process of uploading of SPCs was managed by a phased application process being agreed between the RWG and HSE; the concern regarding excessive fees was alleviated by HSE's intention to streamline applications (where feasible) and re-assurance that all applicants would be invoiced fairly.

Authorisation timeline

The RWG highlighted the requirement for all stewardship authorisations to be granted at the same time in order to minimise confusion in the market and that this needed to be co-ordinated with other aspects of stewardship, such as training and certification and point of sale procedures. This point was agreed and subsequently HSE provided a definitive date when all stewardship authorisations would be granted and the phase-out periods for existing stocks.

Label harmonisation

The RWG's remit to work towards harmonisation and simplification of product labels has involved much discussion within the group. Following the provision of additional information by the HSE and further discussion, the RWG has a list of proposed statements that its feels incorporate the meaning of the phrases historically used by HSE and those required under Article 69 of the BPR, whilst omitting unnecessary and complex words and statements. However, work in this area has been superseded by activities on a European level, specifically the formation of the 'EU AVK SPC Working Party' which has the remit to agree standard sentences and format for the 'Summary of Product Characteristics' (SPC). The RWG has been invited by HSE to comment on several of the proposals arising from the discussions at EU level and the WG has taken the opportunity to comment in order to maximise the efficiency of rodent control whilst minimising environmental and human exposure.

The RWG welcomes the opportunity to provide comment on developments in the EU, in addition to those provided to the Commission by the Cefic Rodenticide Working Group. Whilst we await the final Commission position, we remain concerned that several of the EU proposals are not practical, both in terms of working with the proposed SPCs and, more importantly, in terms of achieving efficient rodent control whilst protecting the environment and people. 'Brexit' may provide an opportunity for the UK to re-visit risk mitigation for SGARs and we encourage HSE to involve authorisation holders in discussions on how this may be achieved.

Monitoring data

To date only a limited amount of monitoring data have been submitted to HSE as required by the stewardship regime. The HSE has advised that data submitted to support continued product authorisation (e.g. data submitted on a rolling basis) will be afforded copyright protection rather than data protection (unless data are required for first authorisation in which data protection will apply).

3.4.3 Key metrics

Progress of the CRRU Regulatory Work Group can be measured by the number of the authorisations granted under stewardship and the timely phase-in of 'stewardship labels' in the marketplace.

3.4.4 Key next steps and work planned in 2017

The CRRU Regulatory Work Group will continue to provide comments to the HSE as required to help shape their position and discussion at meetings of the 'EU AVK SPC Working Party'.

Revised label phrases and risk mitigation measures will be applied following renewal of product authorisation (currently estimated by end 2017).

3.5 Work Group 4. Point of Sale (Leader: Rupert Broome, Killgerm Chemicals)

3.5.1 Structure and representation of CRRU UK Point of Sale Work Group

The CRRU UK Point of Sale Work Group (POSWG) involves 17 participants from 13 organisations and/or companies (Annex 1).

These participants include representation from:

- Authorisation Holders
- Channel Partners
- Professional Pest Control Service Sector
- Agricultural Sector

3.5.2 Objectives

The objectives of the POSWG have been amended slightly from that originally set out in 2015, in order to take into account the finalised label text utilised by HSE when granting authorisations with Stewardship conditions attached to them. This slight amendment did not affect the core objectives of the work group. The amended objectives are as follows:

"The Point-of-Sale Work Group will lead actions to implement the requirement for proof of professional competence at point of sale which is to appear on labels as follows:

- *To be used only by professional users holding certification demonstrating compliance with UK rodenticide stewardship regime requirements.*
- *Read the label before use. Using this product in a manner that is inconsistent with the label may be an offence. Refer to the CRRU UK Code of Best Practice (or equivalent) for guidance.*
- *When this product is supplied to a user for the control of rodents, it shall only be supplied to a professional user holding certification demonstrating compliance with UK rodenticide stewardship regime requirements.*

It will work with all members of the distribution network, in all user sectors, to ensure that necessary mechanisms are operated at point-of-sale so that appropriate qualifications are held by all professional SGAR users. The issue of the purchase of products by company central purchasing functions, and their subsequent use by qualified field operatives, will be addressed."

The POSWG will, as far as possible, develop equivalent mechanisms for demonstration of qualification for internet purchase transactions for professional users of SGARs."

3.5.3 Meetings held

To date, two face to face meetings have been held by the POSWG. Much of the discussion and work done in the creation of the numerous outputs have come from extensive communication and collaboration at a distance.

3.5.4 Output & Achievements

Understanding the Supply Chain

A simplified Supply Chain model has been developed and agreed. This has facilitated the development of the required Supply Chain Compliance checks up to the final sale to end users, and the Proof of Competence checks at the final Point of Sale. The Simplified Supply Chain is set out in figure 7.

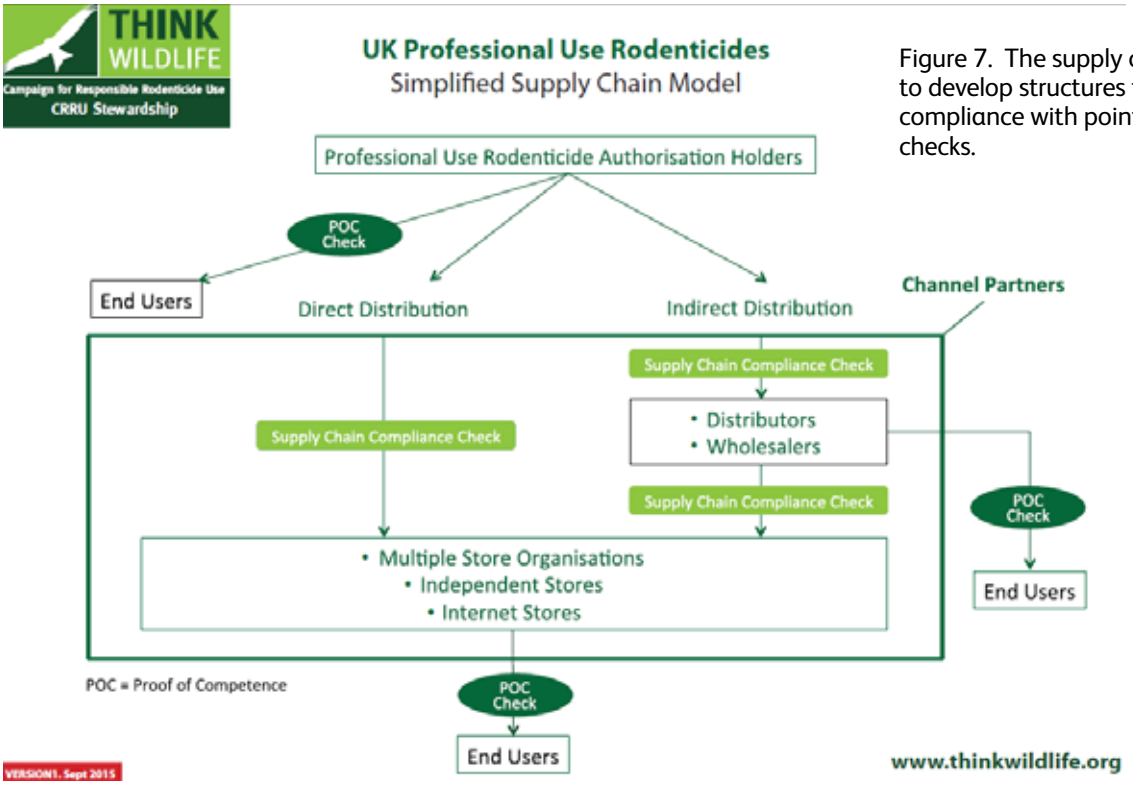


Figure 7. The supply chain model used to develop structures for supply chain compliance with point of sale competence checks.

Supply Chain Compliance Declarations

A one page declaration form has been developed and agreed. This is designed to gain positive commitment to deliver point of sale controls from all Supply Chain Partners acting between Authorisation Holders all the way through to the final point of sale to end-users (figure 8).

Point of Sale Declarations

Two declaration forms have been developed and agreed, each one page long. One is for users who possess CRRU Approved Certification, and the other is for users who are members of CRRU Aligned Farm Assurance Schemes. These Declarations are designed to ensure the proper checks are made for Proof of Competence prior to the sale of Stewardship labelled rodenticides (figure 9).

Point of Sale Question & Answer Support For Implementation

To assist in the interpretation and implementation of the Supply Chain Compliance declarations, and the Point of Sale declarations, a comprehensive Question & Answer set of guidance notes has been developed and agreed. This is an eight-page document and available from the CRRU UK website.[12]

Communication & Roll Out of Supply Chain/Point of Sale Checks

A dedicated section relating to Point of Sale has been created on the main CRRU UK website, acting as an information hub for suppliers and end users from all sectors. The wider CRRU UK Task Force has been fully informed and consulted in the development of all CRRU UK Point of Sale collateral to date, and has approved it.

The outputs of the POSWG, in particular the Supply Chain Compliance Declarations, the Point of Sale Declarations, and the Question & Answer guidance have all been communicated to all Sector Groups (Professional Pest Controllers, Gamekeeping, Agriculture). In addition, all CRRU UK Member companies have been cascading these outputs down their respective supply chains.

3.5.5 Key metrics

Positive Commitment of CRRU UK Member Companies/Authorisation Holders

Currently there are 17 Member companies of CRRU UK, 16 of which are Authorisation holders for rodenticides. All Member companies who are Authorisation holders have been invited to confirm in writing that their companies are fully committed to the full implementation of the point of sale controls as developed by the CRRU UK Point of Sale Work Group. All 16 Member companies who are Authorisation holders have confirmed their commitment in writing.

Number of Products Authorised with Stewardship Conditions Attached to Them

This forms an essential understanding of the scope and complexity of products being offered into the different Sectors through the supply chain. As at 21st September 2016 there are 289 rodenticides authorised with Stewardship conditions attached to them.

Other Key Metrics Considered But Ruled Out For Now

The POSWG has considered a number of other potential metrics, but has ruled out several of these at this time. These include the following:

The Number of Declarations processed was considered as a metric, as was the Number of Customers Authorised to Purchase, but both were rejected on the basis of potential wide scale duplication to the point that the data becomes meaningless, and the excessive complexity of obtaining such data from the entire supply chain. Aside from those key issues, there are also issues of commercial confidentiality which are a serious concern.

3.5.6 Next Steps and Work Planned in 2017

How to Handle Complaints of Non-Compliance in the Supply Chain

Work is ongoing to assess the options for the creation of a clear process for managing complaints of non-compliance in the Supply Chain, along with the required safeguards. The current expectation is that this might form a key metric for future reporting to GOG/HSE.

How to Implement a Standardised Checking Process for the Supply Chain

Work is ongoing to assess the options for the creation of a standardised checking process for all companies within the Supply Chain. The current expectation is that this might form a key metric for future reporting to GOG/HSE.

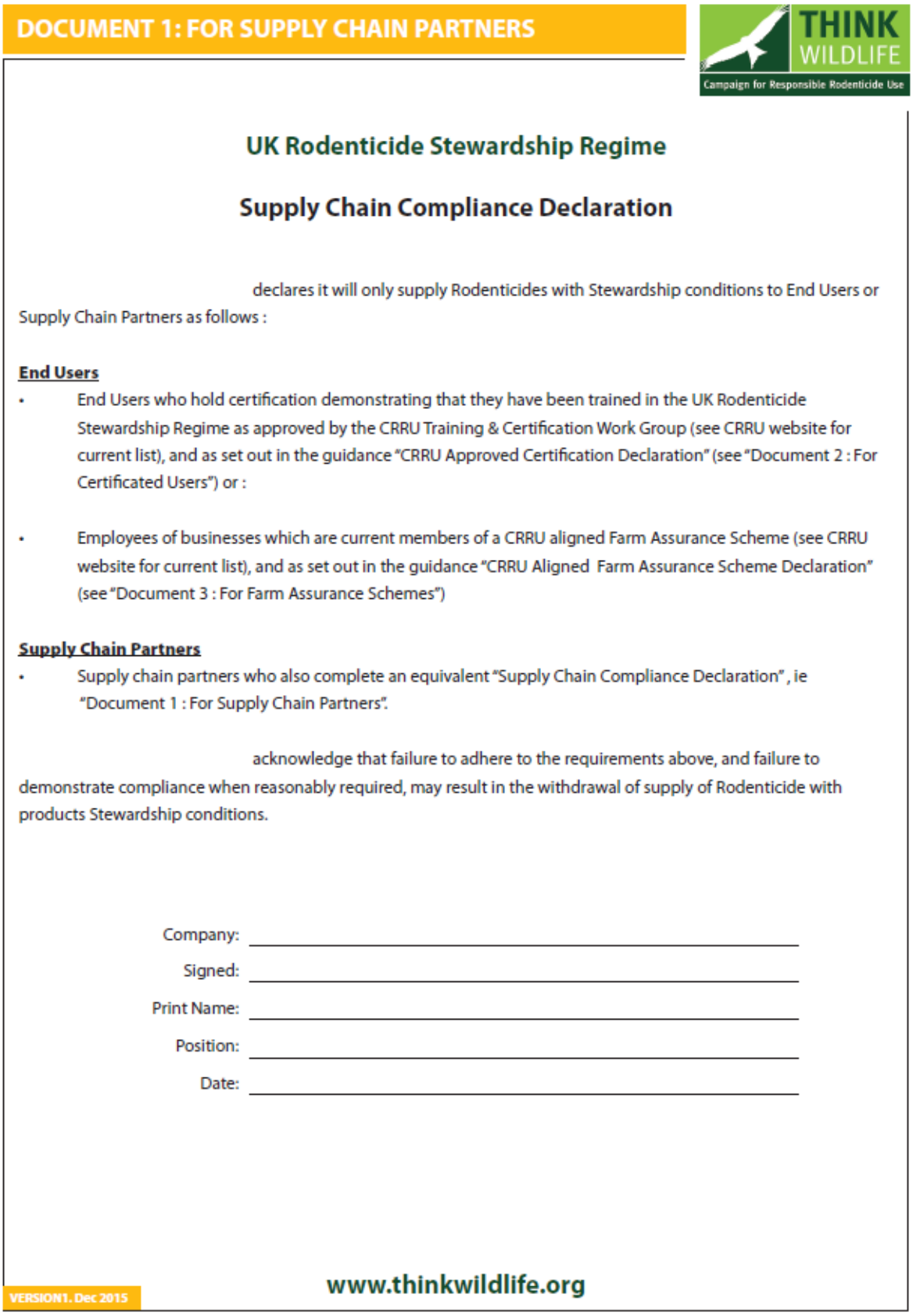
Independent auditing of Proof of Competence Checks

Work is ongoing to scope out an ongoing, independent audit procedure to verify that Proof of Competence checks are being conducted across all sectors. This is to be done by examining existing audit systems currently in place for other similar point of sale compliance checks.

A proposal will be tabled at the forthcoming CRRU UK Task Force meeting in December 2016 for discussion. The current expectation is that this might form a key metric for future reporting to GOG/HSE.

[12] CRRU UK Point of Sale Work Group (2016). Proof of Competence Documents: Question & Answer. Available at: http://www.thinkwildlife.org/stewardship-regime/. Date accessed: 24.10.16

Figure 8.
Supply Chain Compliance Declaration Template



DOCUMENT 1: FOR SUPPLY CHAIN PARTNERS

THINK WILDLIFE
Campaign for Responsible Rodenticide Use

UK Rodenticide Stewardship Regime

Supply Chain Compliance Declaration

declares it will only supply Rodenticides with Stewardship conditions to End Users or Supply Chain Partners as follows :

End Users

- End Users who hold certification demonstrating that they have been trained in the UK Rodenticide Stewardship Regime as approved by the CRRU Training & Certification Work Group (see CRRU website for current list), and as set out in the guidance "CRRU Approved Certification Declaration" (see "Document 2 : For Certificated Users") or :

- Employees of businesses which are current members of a CRRU aligned Farm Assurance Scheme (see CRRU website for current list), and as set out in the guidance "CRRU Aligned Farm Assurance Scheme Declaration" (see "Document 3 : For Farm Assurance Schemes")

Supply Chain Partners

- Supply chain partners who also complete an equivalent "Supply Chain Compliance Declaration" , ie "Document 1 : For Supply Chain Partners".

acknowledge that failure to adhere to the requirements above, and failure to demonstrate compliance when reasonably required, may result in the withdrawal of supply of Rodenticide with products Stewardship conditions.

Company: _____

Signed: _____

Print Name: _____

Position: _____

Date: _____

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Figure 9.
The two Point of Sale Declaration Templates.

DOCUMENT 2: FOR CERTIFICATED USERS

THINK WILDLIFE
Campaign for Responsible Rodenticide Use

UK Rodenticide Stewardship Regime

CRRU Approved Certification Declaration

I as senior person in authority at
declare that only Certificated User(s) will use the Rodenticide products with Stewardship conditions.

Listed below are the designated delivery addresses for and the name of at least one Certificated User at each designated delivery address and I have provided copies of the Proof of Competence (PoC) Certificate(s) to the Supplier Company.

	Address	Certificated User(s) Name
Registered / Invoice Address		
Additional Delivery Address		
Additional Delivery Address		
Additional Delivery Address		

Should require to collect Rodenticide with Stewardship conditions from the Supplier Company or to deliver to a new additional delivery address, then I give permission for the below named person(s) to purchase/collect with the understanding that only the Certificated User(s) will use the Rodenticide with Stewardship conditions.

Named Purchaser / Collector

I also recognise that it is the responsibility of to immediately notify the Supplier Company of any changes to named Certificated Users, eg if they leave the company

Signed: _____

Print Name: _____

Position: _____

Date: _____

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Figure 10.
Farm Assurance Declaration Template

DOCUMENT 3: FOR FARM ASSURANCE SCHEMES

THINK WILDLIFE
Campaign for Responsible Rodenticide Use

UK Rodenticide Stewardship Regime

CRRU Aligned Farm Assurance Scheme Declaration

I as the named Farm Assurance Scheme contact at
declare that all Rodenticides with Stewardship conditions will only be applied by myself and my staff in full compliance with the current Farm Assurance Scheme Standards relating to the control of rodents.

Name & Address of Farm	Farm Assurance Scheme & Membership Number

I hereby give permission for the below named person(s) to purchase/collect only on behalf of the above Farm Assured business, and on the explicit understanding that these products will only be used at the above business while it remains a member of a CRRU Aligned Farm Assurance Scheme .

Named Purchaser / Collector

I also recognise that it is the responsibility of to immediately notify the supplier company of any changes to its Farm Assurance Scheme Membership status.

Signed: _____

Print Name: _____

Position: _____

Date: _____

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3.6 Work Group 5. Monitoring (Leader: Colin Prescott, University of Reading)

3.6.1 Remit

The Monitoring Work Group will establish links with contractor agencies which will deliver all stewardship monitoring projects, including analysis of SGAR residues in barn owl livers, barn owl breeding and population investigations and Knowledge, Attitude and Practice (KAP) surveys. Appropriate contracts will be developed and established between contractors and the funding agencies. The WG will be responsible for the scientific veracity of the monitoring projects, will co-ordinate provision of reports at required intervals and will oversee any other publication of monitoring data.

3.6.2 Monitoring Projects

This report will present information on progress with the four ongoing projects:

1. Knowledge, Attitude and Practice (KAP) survey conducted by iQube Marketing Ltd.

The initial 'Knowledge, Attitude & Practice' (KAP) market research survey was completed in May/June 2105 and published in August 2015 to provide baseline information on the knowledge, attitudes and practice of the three segments of rodenticide users (farmers, gamekeepers and PCO's). The survey will be repeated in 2017 and 2019, in order to follow future changes in user behaviours and responses to the stewardship programme.

The Objectives of the KAP Survey are:

1. To measure awareness of rodent control strategies and control approaches used.
2. To define rodenticide products used, situations, frequency, quantities applied and methods used.
3. To assess knowledge and attitudes regarding potential adverse impacts on humans, non-target animals and the environment for different ways of controlling rodents.
4. To quantify knowledge and degree of implementation of risk mitigation measures.
5. To define awareness, understanding and attitudes to codes of practice, (in particular the CRRU seven-point code of practice) and impact on use practices.
6. To identify influencers and influences and their impact on attitudes and behaviours; including advice sources, training programmes, and communications.
7. To compare and contrast knowledge, attitudes and practices between different types of users (farmers, gamekeepers, professional pest controllers).

The final draft of the first KAP Report is now complete and a PDF version was circulated to the CRRU Directors and the CRRU Regulatory Work Group on 18th October 2015, to HSE on 23rd October 2015, and to the CRRU UK Task Force on 20th September 2016.

For each of the segments of rodenticide users (farmers, gamekeepers and PCO's) the Key Performance Indicators from successive KAP Surveys will be the changes in their response to a series of questions (see Annex 6).

2. SGAR residues in barn owl livers. Study conducted by the Centre for Ecology and Hydrology (CEH).

Two signed Agreements are now in place between CRRU and CEH to cover the barn owl liver residue analysis of 100 barn owl liver samples collected in 2015. The first agreement covers a contribution, with other interested collaborating agencies, to the PBMS running costs for 2015, as a contribution to the costs for collecting the barn owl samples. The second agreement covers the analysis of SGAR residues in100 barn owl livers samples collected in 2015, and the subsequent reporting of that data. An Annex to the second agreement describes in detail the work that will be conducted by CEH for CRRU.

HSE has informed CRRU that the Report on the 2015 barn owl liver residue analysis will not be required formally for demonstration that the CRRU UK Rodenticide Stewardship Regime is complying with the HSE high level principles. Nevertheless, CRRU has proceeded with the analysis and reporting of the 2015 barn owl liver residue analysis as a Pilot study, to provide HSE with an opportunity to confirm whether or not similar studies and reports would satisfy HSE's requirements for barn owl liver residue monitoring in subsequent years. On the basis that HSE considers that the Pilot Study provides useful information to support conclusions about the status of residues of anticoagulants in UK barn owls, CRRU will enter into an agreement with CEH to conduct similar work for barn owls collected in 2016, 2017 and 2018.

Key Performance Indicators identified by CEH/HSE[6]

There should be a significant decrease in the exposure of the sentinel species – barn owl – in terms of sum residues of SGARs detected in livers of barn owl carcasses collected over the first four years.

These are to be measured as:

- Mean low hepatic residue level i.e. ≤100 ng/g wet weight
- Mean high hepatic residue level i.e. >100 ng/g wet weight
- Ratio of barn owls with high to low hepatic residues levels

Draft CEH Report

The draft CEH Report entitled "Second generation anticoagulant rodenticide residues in barn owls 2015" was delivered to CRRU on 19th September 2016.[13] The key points made in the Executive Summary are as follows:

- As in the baseline years (2006–2012),[14] the compounds detected most frequently in barn owls that died in 2015 were bromadiolone, difenacoum and brodifacoum. Of the birds sampled, 95% had detectable liver residue levels of one or more SGARs.
- The metrics to be used for Stewardship Monitoring are:
- Number of barn owls containing detectable residues of flocoumafen and difethialone in 2015 compared to the baseline years.
- For difethialone – numbers were significantly higher in 2015 than in the baseline years
- For flocoumafen – there was no significant difference
- The ratio of birds with "low" (<100 ng/g w.w.) vs "high" (>100 ng/g w.w.) concentrations for any single SGAR or combination of SGARs.
- There was no significant difference between 2015 and the baseline years.
- The average concentrations of brodifacoum, difenacoum, bromadiolone and combination of SGARs in the cohort of owls with "low" residues (<100 ng/g w.w.) and "high" residues (>100 ng/g w.w.).
- For "high" residues, there was no significant difference between 2015 and baseline years for brodifacoum, difenacoum, bromadiolone or combination of SGARs.
- For "low" residues, there was no significant difference between 2015 and baseline years for difenacoum, bromadiolone or combination of SGARs.
- For "low" residues, there was a significant difference between 2015 and baseline years for brodifacoum, with birds that died in 2015 having a marginally, but significantly higher, median "low" brodifacoum concentration than barn owls from baseline years

Overall, the lack of major differences in residue data between birds that died in 2015 and those that died in the baseline years suggests that the baseline data is largely suitable for assessing future changes that may be associated with new SGAR authorisations and stewardship, perhaps with the exception of difethialone detections. It is acknowledged that the rise in difethialone detections probably reflects the recent entry of this active ingredient into the UK market.

As a result of the pilot study of 2015 birds, CRRU UK has some reservations about how some barn owl liver residue data is used to monitor the effects on wildlife contamination of the stewardship regime. These concerns will be discussed with the CEH researchers and, hopefully, resolved.

3. Barn Owl Monitoring Survey (BOMS) to be conducted by the Wildlife Conservation Partnership

Anticoagulant residues in UK barn owls are an indication of the exposure of these birds to rodenticides, but monitoring residues provides no information on the status and breeding success of the UK barn owl population that carries them. It is the purpose of CRRU to monitor various breeding parameters in a representative sample of UK barn owl populations to obtain this information. To this end, a CRRU contract is now in place with Colin Shawyer and the Wildlife Conservation Partnership (WCP) to conduct this work. The contracted output from the WCP will be an "Annual Data Set" giving barn owl nest monitoring data for the preceding season. This will enable CRRU to provide to stakeholders a summary of the status of UK barn owls for examination beside annual residue data collected by CEH.

BOMS will study annually a statistically significant sample of barn owl nests and broods across five regions of the UK. The BOMS investigates the following five areas, surveying a total of 130 nests:

Region 1 - SE Yorks, Mid West Yorks and SW Yorks (25 nests)

Region 2 - East and West Norfolk (25 nests)

Region 3 - Berks, South Hants, North Hants, South Wilts and North Wilts (25 nests)

Region 4 – Kent (25 nests)

Region 5 - Notts, South Lincoln and Cambridge (30 nests).

Key Performance Indicators for each of the proposed survey areas will be:

- Nest occupancy data
- Nest Productivity (mean number of chicks fledged) for productive nests in each region
- Individual records of any chicks which show abnormal development

The 2015 data set will be compared with available historic data from the five regions from 2011 to 2014 and a report published.

[13] Shore, R.F., Walker, L.A., Potter, E.D. and Pereira, G. (2016). Second generation anticoagulant rodenticide residues in barn owls 2015. Draft CEH contract report to the Campaign for Responsible Rodenticide Use. 17 pp.

[14] Shore, R.F., Henrys, P.A. and Walker, L.A. (2104). Power analysis of liver second generation anticoagulant rodenticide (SGAR) residue data in barn owls from Britain: a Predatory Bird Monitoring Scheme (PBMS) report. Centre for Ecology & Hydrology, Lancaster Environment Centre, Library Avenue, Bailrigg, Lancaster, LA1 4AP, UK. 45 pp.

2015 Data Set

Of the 130 barn owl nests monitored in 2015, there was a total of 103 young birds fledged from 41 nests, with evidence of barn owl activity at another 70 nest sites. The mean productivity was 2.51 fledged birds per successful nest.

Region 3 and Region 4 produced the largest number of fledglings, each producing 31 fledged barn owls from 13 nest sites and 12 nest sites respectively (Table 1). Thus nest productivity was greater in Region 4 than in Region 3. Interestingly, Region 5 had a high nest productivity (2.57), which was similar to Region 4 (2.58) and higher than Region 3 (2.38), despite the fact that Region 5 only produced 18 fledged barn owls. This may be a result of a higher proportion of first year birds breeding in Region 3 than in Region 5.

Table 1 Barn owl nest occupancy in 2015, indicating the number of nests monitored and the number of young birds that fledged.

2015	Region 1 (N)	Region 2 (E)	Region 3 (C)	Region 4 (SE)	Region 5 Midlands)	Total
Total number of nests monitored	25	25	25	25	30	130
Nests that produced fledgling birds	5	4	13	12	7	41
Total number of birds fledged	13	10	31	31	18	103
Mean productivity per successful nest	2.60	2.50	2.38	2.58	2.57	2.51

In 2015, 137 adult birds were aged and sexed at 105 nest sites; and 37 % of male birds and 62 % of female birds were found to be in their first year. This probably reflects the very good breeding season of 2014, although it is difficult to explain why the adult birds from the previous year were not occupying the nest boxes. Of 47 non-breeding females that were weighed, all were under the threshold breeding body weight of 360g, and most weighed less than 340g. In comparison, the breeding females weighed between 380g and 430g (Shawyer, personal communication).

It is suggested that the poor breeding of 2015 was the result of low availability of voles, and the high occupancy of nest boxes by first year birds is a result of both the very good breeding season of 2014, and the more experienced birds (2nd year plus) "knowing that they were in no condition to breed, making little attempt to re-settle at their nest sites, thus providing an opportunity for the young incomers" (Shawyer, personal communication).

According to the Barn Owl Trust,[15,16] the marked fluctuations in barn owl breeding productivity year on year are primarily a result of fluctuations in small mammal abundance and to extreme weather events. The breeding season of 2013 was particularly bad for barn owls. According to the Barn Owl Trust,[15] the month of March 2013 was the coldest reported since 1962, and during that month, numbers of dead barn owl reported to the BTO were 280 % above normal. With nest occupancy estimated to be below 70 % of the 'all-years' average, it has been suggested that in some regions, 2013 has been 'the worst year in 30 years' for barn owls.

In contrast, 2014 was one of the warmest years on record, resulting in a peak year for small mammals, and a very productive year for barn owls in many areas. As a result, total numbers of young barn owls ringed in the nest by the British Trust for Ornithology in 2013 and 2014 were 3,042 and 14,446 respectively. This is indicative of the extreme fluctuations in barn owl breeding that commonly takes place in the UK, which is at the extreme north of their geographical range.

The 2016 data collection is ongoing and the 2016 data set should be received by CRRU in the first quarter of 2017.

4. The effects of vertebrate pesticides, including anticoagulant rodenticides, used in the UK on non-target animals by the analysis of data from the Wildlife Incident Investigation Scheme (WIIS).

This scheme is well-known to members of the Government Oversight Group and will not be further described here. Incident data is presented in summary form on the web-site of the HSE (http://www.hse.gov.uk/pesticides/topics/reducing-environmental-impact/wildlife.htm). Since data on individual incidents was first made publically available in 1993 (in those days in the form of published reports), a data-base has been maintained by the University of Reading containing information on all incidents involving vertebrate control agents, including anticoagulant rodenticides. This information is periodically interrogated and the results presented. This was done most recently at the meeting of the Society of Ecotoxicology and Chemistry (SETAC) in

[15] Barn Owl Trust (2014) State of the UK Barn Owl population – 2014. Available at: http://www.barnowltrust.org.uk/wp-content/uploads/State-of-the-UK-Barn-Owl-population-2014-updated-Sept-2015.pdf. Date accessed: 22.09.2016.

[156] Barn Owl Trust (2015) State of the UK Barn Owl population – 2015. Available at: http://www.barnowltrust.org.uk/wp-content/uploads/State-of-the-UK-Barn-Owl-population-2015.pdf. Date accessed: 22.09.2016.

Berlin[17] in 2012 (see Annex 7). Similar reports will be produced by CRRU for the GOG to support monitoring of the stewardship regime.

3.6.3 Issues Relevant to the Monitoring WG

Copyright Protection

For all Monitoring Project Reports, protection against free-riders has been a major concern for CRRU UK and the Monitoring Work Group. Initially, a request was made to HSE that reports of all monitoring work should remain confidential and provide no opportunity of access to free-riders, who have neither contributed to the CRRU stewardship process nor to the costs of the residue monitoring and other projects. Subsequently, both HSE and CRRU UK have taken legal advice and have resolved that, as long as copyright is appropriately addressed in the contract between CRRU and the contractors supplying the studies, then HSE cannot use the monitoring data financed by CRRU UK for the purpose of supporting an authorisation where:

- A third party submits the published report of the monitoring data to HSE as part of their product application,

or

- a submits the unpublished report of the monitoring data to HSE, having obtained it via a request under the Environmental Information Regulations (EIR).

[17] Buckle A.P. and Prescott C.V. (2012) Monitoring Impacts of Vertebrate Pesticides in the UK: 1993 to 2011. 6th SETAC World Congress 20-24 May 2012.

3.7 Work Group 6. Communication (Leader: Phil Christopher)

3.7.1 Structure and representation of the CRRU Regulatory Work Group

The WG comprises the Leader, Phil Christopher, who receives support from the CRRU UK Chairman Alan Buckle (Annex 1).

3.7.2 Remit

Expressed formally in the original stewardship regime documentation as: "Dissemination of information from CRRU to external agencies about CRRU's co-ordination of the Stewardship Regime."

With members of the CRRU UK Task Force, a strategy was developed to address the three rodenticide user groups, namely farmers, gamekeepers and professional pest controllers - separately and specifically whenever this was possible (more detail below).

In farming and gamekeeping, using original material produced for this purpose by CRRU UK, significant responsibility for communications was devolved to, and taken up by, each sector's stakeholder organisations. In parallel with CRRU UK in the pest control sector, the manufacturer/supplier members of the CRRU UK Task Force have each played a significant role communicating the changes among their own customer groups and stakeholders.

3.7.3 Output and achievements

Addressing the three rodenticide user groups - farmers, gamekeepers and professional pest controllers - separately and specifically whenever this was possible, communications activity was arranged thus:

Farmers: Led and co-ordinated by the multi farming sector Agriculture and Horticulture Development Board (AHDB), in conjunction with the four relevant farmers' organisations, National Farmers Union, NFU Scotland, Farmers Union of Wales, and Ulster Farmers Union.

Gamekeepers: Led and co-ordinated by the National Gamekeepers Organisation, in conjunction with Scottish Gamekeepers Association, Game and Wildlife Conservation Trust, British Association for Shooting and Conservation and Countryside Alliance.

Professional pest controllers: Led and co-ordinated by CRRU, in conjunction with rodenticide suppliers. A CRRU Supporters Club established several years ago has more than 300 individual pest controller members. Items in the table below that are relevant to this group are published to them in email newsletter format.

Orientated to each user sector, CRRU produces short and long-form narrative, all geared to enabling stewardship-readiness, for publication in print and online by independent publishers and our stewardship partners/stakeholders. The narrative content covers:

- why stewardship is needed,
- the importance of individual and collective responsibility,
- what is going to change and when, and
- how rodenticide users should align their work practices for stewardship-compliance.

Arising from the following list of completed work, Annex 8 shows examples of published material.
Table. Example communications concerning the stewardship regime.

Release/completion date	Publisher(s)	Title
9 Sep 2016	Press release (pest control, farming & gamekeeping)	No certification, no sale of rodenticides from 1 October
17 Aug 2016	Pig World feature (Sept)	Rodent Control on UK Farms is Changing NOW
17 Aug 2016	Editorial for CRRU agri-stakeholders' use	Rodent Control on UK Farms is Changing NOW (non-sector-specific adaptation of Pig World original)
9 Aug 2016	Scottish Quality Crops member newsletter article	Rodent Control is Changing
27 Jul 2016	PEST magazine feature	Rodenticide stewardship: Update from the sharp end
27 June 2016	All sectors press release	Brexit and the CRRU UK Rodenticide Stewardship Regime: Business as usual
19 May 2016	Sector specific (x3) press releases	Farms/gamekeepers/pest controllers alerted to end of routine long term rodenticide baiting
30 Mar 2016	Farm sector press release	Nine assurance schemes approved for rodenticide stewardship
5 May 2016	All sectors press release	Rodenticide stewardship standard label text confirmed by HSE
28 Apr 2016	Article commissioned by BPCA for members' magazine	Stewardship surprises still in store and at least one known unknown still to be resolved
16 Mar 2016	Sector specific (x3) press releases	Reminder to pest controllers: Compulsory proof of competence and I/D for rodenticide purchase
4 Mar 2016	Sector specific (x3) press releases	Farms/gamekeepers/pest controllers alerted to end of routine long term rodenticide baiting

12 Feb 2016	Agri-press briefing teleconference	Farms alerted to end of routine long term rodenticide baiting
4 Feb 2016	Sector specific (x3) press releases	Rodenticide stewardship's complex timelines clarified
16 Dec 2016	Sector specific (x3) press releases	Rodenticide stewardship point-of-sale controls announced
20 Nov 2016	Farm sector press release	Three more assurance schemes approved for UK Rodenticide Stewardship compliance
26 Aug 2016	Sector specific (x3) press releases	Long-term baiting no longer
26 Aug 2016	Sector specific (x3) press releases	Rodenticide stewardship 'grandfather' rights confirmed for gamekeepers/ farmers/pest controllers
12 Aug 2016	Sector specific (x3) press releases	Rodenticide stewardship's complex timelines clarified

3.7.4 Key metrics of the CRRU communications WG

The KAP report provides a number of key metrics for the assessment of the effectiveness of communication. It is suggested that changes over time, assessed separately within the different user groups, will provide appropriate sentinel metrics for the effectiveness of CRRU's communications with these groups and of the overall communications strategy (see Annex 6 for further details).

3.7.5 Key next steps and work planned in 2017

For the period October 2016 to June 2017, the communications theme is ***'Leading by example'.***

This involves continuation of the strategy and tactics outlined above, with a shift in content towards case study narrative about best practice rodent control by farmers, gamekeepers and professional pest controllers. In addition to covering what they are doing, a key element will be WHY, thereby employing strong peer-to-peer support for the uptake of stewardship-compliant practice.

In view of the metrics proposed in section 3.7.4, examples will be pursued in particular where permanent baiting has been superseded by stewardship excellence and with consistently good results.

4. Conclusions

Conclusion on the progress and conduct of the CRRU UK stewardship regime are presented here briefly under the headings used in the HSE guidance notes with links to the 'High Level Principles'.[5]

A summary of the information provided in the report, and to be presented to GOG on an ongoing basis, is given in the table below.

Table. Provision of data to meet requirements set out by the Government Oversight Group[5]

Required data		Data to be provided
1	Environmental Impacts (Monitoring Compliance)	1. CEH annual survey of residues in livers of 100 barn owls
		2. Annual survey of barn owl breeding performance
		3. Annual review of WIIS incidents
2	Whether the rodenticides are effective (Competent Workforce)	1. Annual report of training uptake and award of certification/ qualification by CRRU-approved awarding bodies
		2. Annual report of number of members of CRRU-approved farm assurance schemes
		3. Provision of up to date, relevant best practice guidance documents
		4.Promotion of regime objectives and raising awareness by stakeholder organisations
3	Resistance monitoring (Competent Workforce).	1. Annual report of status of resistance monitoring in UK and elsewhere in EU
4	Awareness using the Knowledge, Attitude and Practice (KAP) survey (Competent Workforce/Monitoring Compliance)	1. KAP survey baseline study (published)
		2. Repeated KAP surveys in 2017 and 2019
5	Point of sale information (Supply Chain Governance)	1. Examination of options for point of sale compliance audits by independent organisations
6	Training (Competent Workforce)	(see point 2 above)

4.1 Environmental Impacts (Monitoring Compliance)

Many recent studies provide information on the occurrence of residues of anticoagulants in UK wildlife. However, after due consideration, HSE has nominated the barn owl as the sentinel species.[18] Principle considerations were: 1) the species is a reasonable surrogate for several wildlife species who rely for their food on wild small mammals, 2) there is an extensive long-term data-set available for barn owl against which future change in the frequency and concentration of rodenticide residues can be measured, 3) it is a species of high conservation value and 4) the species is widely distributed in the UK. A study of its historical data on barn owl liver residues published by CEH permits good statistical accuracy in measuring changes in a number of biological parameters.[14] Therefore, CRRU UK will conduct an annual study, in collaboration with CEH, to measure changes in HSE-nominated parameters related to barn owl rodenticide liver residues. CRRU UK will also conduct annual monitoring of barn owl breeding success in selected UK populations to provide biological context to this study.

To remain abreast of any other developments on potential environmental impacts CRRU UK will implement and publish an annual review of data relating to vertebrate poisons, wildlife companion animals and farm stock derived from the Wildlife Incident Investigation Scheme and CRRU UK technical advisors will conduct regular searches of the scientific literature for relevant publications.

4.2 Whether the rodenticides are effective (Competent Workforce)

Many different considerations play a part in determining the effectiveness of rodenticides, including their intrinsic properties of efficacy.[19] However, the competence of those applying rodenticides is important in determining the safety and effectiveness of applications. A factor which strongly influences competence is the status of training (and subsequent certification/qualification) and the nature of available means of providing to the workforce a continuous means of improving skills.

The CRRU UK T&CWG has played, and will continue to play, a significant role to ensure that rodenticides are effectively and safely used through training and CPD. Changes in competence, and in the application of best practice, will be monitored through periodic KAP surveys.

4.3 Resistance monitoring (Competent Workforce)

Anticoagulant resistance may be more severe and widespread in UK than elsewhere and is a severe threat to the sustainable use of these active substances.[20] The progression of resistance results in a need to use more potent (and therefore persistent) anticoagulants against resistant populations. Knowledge and competence is essential, both when applying rodenticides against susceptible rodents, to delay the onset of resistance, and in treatments to remove resistant rodent infestations. The Rodenticide Resistance Action Committee provides a comprehensive guide on the management of resistance that is available to all who use professional rodenticide products.[21]

CRRU UK has expressed a willingness to consider and support any initiatives conducted in the UK to prevent the further development of the severity of resistance and to curtail its spread. CRRU will consider the provision to the GOG of a review of available information in the UK and elsewhere in Europe.

4.4 Awareness using the Knowledge, Attitude and Practice (KAP) survey (Competent Workforce/ Monitoring Compliance)

[19] Chartered Institute of Environmental Health (2016). Justification for the renewal of the approvals for the anticoagulant rodenticides brodifacoum, bromadiolone, chlorophacinone, coumatetralyl, difenacoum, difethialone, flocoumafen and warfarin. 5 pp. Available from: https://circabc.europa.eu/w/browse/5f70e66e-5af3-4c1b-9196-899ee5bef772. Date accessed: 27.10.16

[20] Buckle, A.P. (2013). Anticoagulant resistance in the United Kingdom and a new guideline for the management of resistant infestations of Norway rats (Rattus norvegicus Berk.). Pest Management Science. 69(3):334-41.

[21] Rodenticide Resistance Action Committee (2016). RRAC guidelines on Anticoagulant Rodenticide Resistance Management. CropLife International, Brussels. 32 pp. Available from: http://www.rrac.info/content/uploads/RRAC_Guidelines_Resistance.pdf. Date accessed: 27.10.16.

The baseline KAP survey that was conducted during May/ June 2015 has been published and submitted to HSE. The survey will be repeated in 2017. Much of the information provided by the report is relevant to a 'competent workforce' and the 'monitoring of compliance'. A number of key performance indicators have been extracted from the survey by the work groups to provide measures of their performance.

4.5 Point of sale information (Supply Chain Governance)

All manufacturers and authorisation holders for rodenticide products used outdoors by professionals have joined CRRU UK and have contributed to the development and implementation of the stewardship regime. Manufacturers are responsible for the implementation of 'stewardship conditions' requirements on sale of professional rodenticides that appear on product labels. This responsibility is necessarily shared with supply chain partners who operate relationships with their customers, be they face-to-face, on the telephone or using web-based systems, as proxy for manufacturers and authorisation holders. The systems put in place along the supply chain (figure 7) so that point of sale checks for competence are correctly implemented, are explained in the body of the report and the documents used to formalise these agreements are provided (figures 8 and 9).

CRRU UK is to make an assessment of schemes currently in place by which independent audits are conducted of point of sale competence checks in other stewardship schemes. Proposals will be brought forward to the GOG when proper consideration and consultation has been completed.

4.6 Training (Competent Workforce)

Much of the foregoing report has been concerned with the training of a competent workforce which conscientiously applies best practice (sections 3.2. and 3.3) among all rodenticide user groups, and with point of sale checks for competence. CPD is an essential element which will be integrated in future into CRRU UK training and competence requirements.

Annex 1. CRRU UK stewardship implementation Work Group Participants.

Representative	Organisation
Work Group 1. Best Practice	
Nic Blaszkowicz	PelGar International
Alan Buckle	University of Reading/CRRU
Dee Ward-Thompson (Leader)	BPCA
Iain Turner	NPTA
Richard Moseley	Bayer Crop Science Ltd
Emma Hammer	NFU
Tim Peeling	Pelsis
Matthew Davis	Killgerm Chemicals
Katja Stoddart	AHDB
Paul Charlson	CIEH
Colm Moore	Rentokil Initial
Work Group 2. Training and Certification	
Helen Ainsworth	Barrettine Environmental Health
Andrew Bauer	NFUS
Nic Blasczkowicz	PelGar International
Richard Burton	RSPH
Paul Charlson	NPAP-CIEH
David Cross	Rentokil Initial
Matthew Davies (Leader)	Killgerm Chemicals
Tony Davies	NPTC
Adam Hawley	NPTA
Brady Hudson	Bell Labs
Andy Hughes	Antec DuPont
Stephen Jacob	BASIS Registration Ltd
Oliver Madge	LANTRA
Mandy McCarthy-Ward	BPCA
Charles Nodder	NGO
Dave Oldbury	NPAP-CIEH
Lee Osborne	NFU
David Fisher	LANTRA
Katja Stoddart	AHDB
Gavin Wood	BASF
Work Group 3. Regulatory	
Sarah Bull (Leader)	BASF
Gabrielle Cor	LiphaTech
Amy Jarman	Rentokil Initial
Dawn Kirby	Rentokil Initial
Jayne Harris	Bayer CropScience
Brady Hudson	Bell Laboratories
Stephen Leahy	Killgerm Chemicals
James Pemberton	Syngenta Crop Protection
Charles Phillips	Barrettine Environmental Health
Mariateresa Rigato	ZAPI
Roger Sharples	BASF

Mike Swan	Game & Wildlife Conservation Trust
Anne Withall	PelGar International

Work Group 4. Point of Sale	
Steve Bailey	Barrettine
Nick Blaszkowicz	PelGar
Rupert Broome (Leader)	Killgerm Chemicals
Kevin Brown	Rentokil Initial
Gareth Capel-Williams	PelGar
Matt Davies	Killgerm
Andy Deeks	Antec DuPont
Hazel Doonan	AIC
Ross Goodman	LODI UK
Tom Holmes	Pelsis
Andy Hughes	Antec DuPont
Ben Jordan/Paul Meredith	Mole Valley Farmers
Paul Meredith	Mole Valley Farmers
Ian Scott	AHDA
Roger Simpson	LODI UK
Liz Webb	LODI UK
Gavin Wood	BASF
John Worley	AIC

Work Group 5. Monitoring	
Colin Prescott (Leader)	University of Reading
Ton Abel	ZAPI
Alan Buckle	University of Reading/CRRU
Gareth Capel-Williams	PelGar International
Alex Cornish	Syngenta Crop Protection
Matthew Davies	Killgerm Chemicals
Alastair Leake	GWCT

Work Group 6. Communication	
Phil Christopher	Red Rock Publicity
Alan Buckle	University of Reading/CRRU

Annex 2. CRRU UK Work Group meeting diaries. Only formal, scheduled meetings are recorded.

Work Group	Type of meeting	Purpose	Date
1. Best Practice	face-to-face	Kick off meeting. Deciding on best way forward to measure schemes against the CRRU BP document, action given to make a mapping tool	09/07/2015
	face-to-face	Mapping tool reviewed- agreement for the process to review new schemes wishing to join, allocation of schemes to BP group members to make contact.	05/10/2015
	face-to-face	Sign off on mapping tool, process for schemes discussed, all current schemes allocated a contact and mapping tool to be sent. ERA discussed, the need for a simplified version	14/12/2015
	face-to-face	Discussion on progress so far, issues highlighted on ERA decision made to revise	18/04/2016
	face-to-face	Review of completed mapping tools started, discussions on the schemes that have not completed the mapping tool, point of sale questions addressed	25/08/2016
	face-to-face	Mapping tool support total of 8 meetings with 2 farm schemes all face to face with travel = 8 days	2015-2016
	face-to-face	Meetings with schemes and email and telephone communication = 10 days	2015-2016
2. Training and Certification	face-to-face	T&C WG meeting	16/03/2015
	on-line	Consultation on a training certification	25/03/2015
	on-line	Consultation on a training certification	01/04/2015
	on-line	Consultation on a training certification	07/04/2015
	on-line	Consultation on a training certification	08/04/2015
	face to face	T&C WG meeting.	13/04/2015
	on-line	Consultation on a training certification	14/04/2015
	on-line	Consultation on a training certification	18/04/2015
	on-line	Consultation on a training certification	29/04/2015
	on-line	Consultation on a training certification	08/05/2015
	face to face	T&C CPD sub-group meeting.	22/07/2015
	on-line	Consultation on a training certification	01/09/2015
	on-line	Consultation on a training certification	14/10/2015
	on-line	Consultation on a training certification	19/02/2016
	face to face	CRRU WG leaders & HSE meeting	03/05/2016
	face to face	T&C Awarding Organisations sub-group meeting	02/06/2016
3. Regulatory	face-to-face	Kick off meeting. Discussion of potential issues with the application process for SGAR use under stewardship and proposed solutions.	20/03/2015
	teleconference	Discussion on response received from HSE re. issues and proposed solutions. Discussion on proposals for simplified label phrases.	13/04/2015
	teleconference	Preparation for HSE telecon on 8 May re. the application process and requirements.	06/05/2015

	teleconference	Discussion on R4BP3 and application issues and evaluation fees.	08/05/2015
	teleconference	Preparation for HSE meeting in Bootle.	08/06/2015
	face-to-face	Meeting with HSE in Bootle to discuss timescale for authorisation under stewardship, scope for HSE to change label phrases, joint labelling and proposed simplified label statements.	05/08/2015
	teleconference	Discussion on simplified label phrases following additional information provided by HSE.	16/09/2015
	on-line	Discussion and comments on the draft SPCs as proposed by European Commission (CRRU Reg WG comments requested by HSE).	18/02/2016
	teleconference	Discussion and comments on the revised draft SPCs as proposed by European Commission (CRRU Reg WG comments requested by HSE).	22/08/2016
4. Point of Sale	face-to-face	Initial meeting of full WG to agree representation, objectives and proposed outputs	16/04/2015
	face-to-face	Presentation to AHDB Conference	20/01/2016
	face-to-face	WG Report to CRRU Task Force	08/06/2016
	face-to-face	Meeting of full POS WG to agree structures and procedures and to discuss monitoring POS compliance	19/07/2016
5. Monitoring	teleconference	Discussions with iQube regarding KAP Survey	10/04/2015
	face-to-face	Discussions with Colin Shawyer regarding barn owl monitoring scheme	13/04/2015
	face to face	Discussions with Richard Shore regarding PBMS and barn owl liver residue analysis	27/04/2015
	face-to-face and teleconference	Discussions with iQube regarding KAP Survey	05/05/2015
	face-to-face	Discussions with Colin Shawyer regarding barn owl monitoring scheme	02/02/2016
	face-to-face	Discussions with Colin Shawyer regarding barn owl monitoring scheme	11/07/2016
6.Communications	face-to-face	CRRU UK Task Force: Briefing on latest developments and identification of communications priorities	03/11/15
	face-to-face	AHDN/NFU: Discussion and planning of agriculture sector activities, being led by AHDB	02/03/16
	face-to-face	CRRU UK Task Forcel: Briefing on latest developments and identification of communications priorities	08/06/16
	Telephone consultation with Alan Buckle	Updates about latest developments, messages and methods	various

Annex 3:

Map of the content of farm assurance standards to CRRU code of best practice key indications.

Required for approval of farm assurance schemes post-December 2017 by the CRRU BP WG, as certification demonstrating compliance with UK rodenticide stewardship regime requirements

Farm assurance scheme: xxxxx

CRRU COBP key indication	Farm Assurance standards – example content	Evidence required
1. The 'risk hierarchy' a) Evidence of a hierarchical risk assessment, showing that the least severe but effective method of control has been selected		Hierarchical risk assessment, justifying the selected control method.
2. Avoiding rodent infestations a) Exclusion / proofing – the aim is to keep rodents out of buildings b) Hygiene – prevent rodent access to food c) Harbourage – sites are to be made less attractive to rodents as places to live and breed		On-site evidence of proofing measures, absence of food spillages and reduced rodent harbourages e.g. lack of vegetation cover at building perimeters.
3. What to do before treatment a) Areas of use – it is essential to apply rodenticides only in those areas where their use is permitted by the product authorisation and shown on the product label b) Site survey – to include type, level and extent of infestation. Identify non-target animals, housekeeping, hygiene and proofing issues		Check relevant product labels against on-site bait locations, to determine correct area of use e.g. are baits applied in 'open areas', 'in and around buildings', 'indoors' in line with label requirements. A site survey report must be present.
4. Risk assessments a) COSHH assessment – identify risks to operators and others who may be affected by treatments involving hazardous substances and record the findings b) Environmental risk assessment – conduct this when a risk to the environment has been identified during the site survey. Record this assessment in writing		COSHH assessment present. Environmental risk assessment present.
5. Guidance for treatments a) Use a variety of control methods – it is important that you do not rely solely on the use of rodenticides to control rodents b) Placing the bait – make sure bait is adequately protected from children and non-target animals		On-site evidence of proofing measures, good hygiene, harbourage reduction and traps where appropriate. Check bait is applied in tamper-resistant bait stations or covered bait points or secured so that children and non-target animals cannot access it.
6. Records a) Make a written record of where you have placed the bait, which rodenticide was used and how much bait has been laid		Bait plan present.
7. Monitoring a) If you have decided that the application of a rodenticide is needed and the treatment phase is underway, it is important to monitor it regularly to track its progress		Evidence of regular inspections of rodenticide baits, in line with label requirements.
8. Replenishing bait a) Once laid, baits should be inspected frequently and where bait has been eaten, it should be replenished as necessary according to the schedule on the product label		Evidence of regular replenishment of rodenticide baits, in line with label requirements.

9. Removal of dying / dead rodents a) Search for and remove any dying and dead rodents and dispose of them safely, in line with the product label. This is particularly important to reduce the risk of secondary poisoning, especially in areas where birds of prey and other predators/scavengers are known to be active		Records of searching for and the removal and disposal of rodent bodies.
10. Long-term baiting a) long-term perimeter baiting should never be used as a routine rodent control measure b) Consider any long-term baiting programme carefully and be justified in your risk assessments for each location where this strategy is used. The preferred approach is to use either traps or non-toxic baits as a guide to the presence of an infestation of pest rodents that may then trigger the use of a rodenticide		Check pest control records e.g. environmental risk assessment, for a justification of long-term perimeter baiting.
11. Retrieval of bait a) After you have finished the treatment, you must make every effort to ensure all traces of the bait have been removed from the site and disposed of according to the label instructions		Records of rodenticide bait disposal.
12. Storage of bait a) Keep all rodenticides secure in a suitable store		Rodenticides are kept in a secure pesticide store.
13. Operations after removal of rodent infestations a) Once adequate control has been achieved the environmental management measures in point 2 should be considered and implemented as appropriate		On-site evidence of proofing measures, absence of food spillages and reduced rodent harbourages e.g. lack of vegetation cover at building perimeters.

Annex 4. CRRU UK Training and Certification Framework

Campaign for Responsible Rodenticide Use

Proposals for Development of Courses in Rodent Pest Management and Associated Approved Certifications

Background

Training is a key aspect of professional competence. Those who conduct operations of rodent pest management as a part of their professional duties must be in possession of a wide range of technical information and skills. The possession of this information ensures that work is carried out to the highest professional standard to permit effective rodent control with the minimum risk to humans, both operators and bystanders, non-target animals and the wider environment.

These requirements are applicable to a wide range of individuals, including professional pest control technicians and staff of Local Authorities who conduct rodent management operations on a routine basis, and to those, such as farmers, gamekeepers and land-managers, who conduct rodent pest management periodically.

Rodenticide products placed on the market by manufacturers are of two types: 1) 'amateur' products are intended for members of the general public to control rodents in and around their homes and premises; 2) 'professional' products are intended for use by those who offer a paid professional service of pest control or where it forms a part of their regular operational duties. Usually professional products are sold in packs containing larger quantities of rodenticide. Those who purchase and use rodenticide products intended for use only by professionals are required to possess specialist knowledge that permits such products to be used effectively and safely.

This document describes a framework for approved training courses set out by the Training and Certification Work Group (T&C WG) of the Campaign for Responsible Rodenticide Use (CRRU). Thisis to be applied to courses, and their associated syllabuses, intended to provide approved professional certification in rodent pest management for the purchase and use of rodenticide products, including those containing second-generation anticoagulants (SGARs).

Possession of an approved certification obtained after appropriate training, will demonstrate professional competence at the point-of-sale and permit purchase of rodenticide products, which are to be labelled under HSE 'stewardship conditions' as follows:

'For supply to and use only by professional users holding certification demonstrating that they have been trained according to the UK second generation anticoagulant rodenticide (SGAR) stewardship programme requirements.'

Training Framework

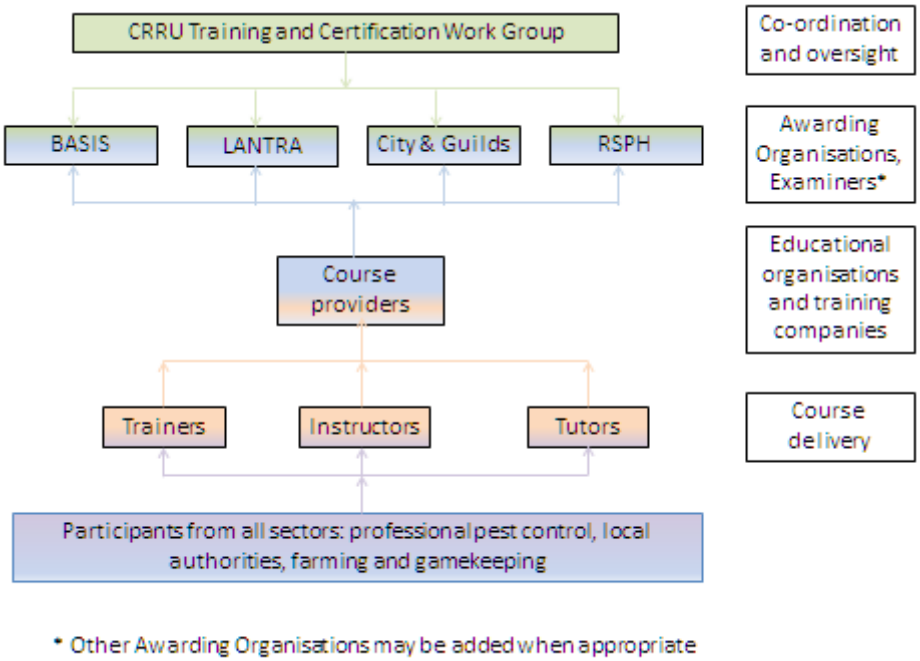
It is envisaged that, like other similar programmes, the training framework will operate at four levels. The CRRU Training and Certification Work Group will provide co-ordination and oversight, as well as determination of the appropriate course content for all courses leading to an approved certification (see below) to ensure that they provide an appropriate "proof of professional competence" at point-of-sale.

Organisations that provide approved certification will develop syllabuses which cover the subject areas set by the CRRU T&C WG. Training companies will develop and offer courses that meet the requirements of these syllabuses. Trainers/tutor/instructors will deliver courses to participants from all sectors.

Awarding Organisations will set, mark and moderate examinations and set guidelines for invigilation (where appropriate). They will also maintain records of trainer performance, keep a register of those participants who have met required standards and will provide a training certificate. Awarding Organisations may consult from time to time so that examination procedures and qualifications meet agreed standards.

Awarding Organisations may make appropriate charges for setting and marking examinations and for keeping registers of certified personnel.

Fig. 1. Framework for development and delivery of courses towards certification in rodent pest management for professional SGAR users.



Course Structures

Courses leading to approved certification will have the following attributes:

1. Training courses may employ conventional 'face-to-face' teaching, on-line learning and home learning or a combination of these methods.
2. Training courses must be designed to lead to a certification via examination.
3. The examination must be set, marked and moderated by an established organisation which provides recognised certification.
4. The exam will be taken either in a secure on-line environment or in an invigilated environment. Exam marking should not be carried out by those who teach the course.
5. Attainment of the required standard in the examination by a candidate will result in the provision of a training certificate.
6. Examples of relevant Awarding Organisations for different user sectors are:
    a. RSPH
    b. BASIS
    c. City and Guilds
    d. LANTRA
    e. Others when appropriate
7. The organisations which award qualifications must maintain a register of qualified personnel and maintain a record of the exam pass rates for each trainer and/or training agency that offers the course.
8. The training may be either broadly based or may be intended for those who conduct rodent pest management in specific and defined circumstances. However, certain common learning outcomes will be required from all approved courses (see below).
9. As well as these common required learning outcomes, courses may address specific types of application, for example by particular user groups such as farmers, gamekeepers and professional pest control technicians, or specific areas such as sewers, food handling establishments, animal husbandry units and waste management facilities.
10. The amount of training time required by each course will be proportional to the scope of the course in terms of the number of different use scenarios presented. Broader courses covering more use scenarios would be expected to require longer contact periods.
11. The organisation that awards the certification, or another organisation, may maintain a facility for monitoring continuing professional development (CPD) to ensure that knowledge remains up-to-date.

Necessary Course Content:

Those who attend a course leading to an approved certification, take and pass the examination and attain the certification should have a sufficiently comprehensive understanding of the following subject areas to permit them to carry out safe and effective rodent management operations. However, the extent to which each subject area is addressed in a course should be relevant to the candidates attending the course:

a. Reasons for rodent pest management.
b. Importance of the product label and the information it provides. Regulation and legislation relevant to rodent pest management.

a. Biology and behaviour of rodent pest species.

b. Aspects of the ecology and behaviour of non-target species relevant to rodent management activities.

c. The 'Risk Hierarchy'. Concept of 'severity' of rodent management interventions. Implementation of rodent management strategies which involve the use of interventions that are 'least severe - but effective'.

d. Potential risks to human and animal health and of environmental contamination from the use of rodenticides. Routes of exposure and appropriate measures to reduce risks. Current extent of wildlife contamination with rodenticides. Training should include instruction about the conduct of an Environmental Assessment and other relevant risk assessment procedures.

e. Consideration of appropriate treatment outcomes for different use scenarios. For example circumstances in which complete rodent eradication may be required and where it is not.

f. Elements that may comprise a safe and effective Integrated Rodent Management programme that is proportionate and relevant to the user group receiving the training. These may include rodent survey, physical control techniques, chemical control techniques, environmental management and monitoring.

g. Use of rodenticides in practice, including: effective and safe methods of bait application in use scenarios appropriate to the participants (such as sewers, in and around buildings, open areas and waste dumps), the requirement to search for and safely dispose of rodent carcases, what to do in the case of accidental exposure or consumption of baits by human and animal non-targets.

h. Anticoagulant resistance; where it is found and what its practical effects are. Techniques to adopt to avoid the development of resistance and to overcome resistant infestations.

i. Aspects for consideration at the closure of a rodenticide application including measures necessary to prevent re-infestation, such as housekeeping, habitat modification and proofing of vulnerable structures.

j. The importance and benefits of record-keeping.

k. Safe storage of rodenticide products and safe disposal of spent bait.

Annex 5. Training qualifications and certifications approved by the CRRU Training and Certification Work Group appropriate for proof of professional competence at point of sale under the conditions of the CRRU UK Stewardship Regime.

CRRU Training and Certification Work Group approved certification (26.02.2015), acceptable at the point-of-sale for purchase of professional use rodenticides under the terms of the UK rodenticide stewardship regime

'Grandfather' certification	Current certification	Update certification
RSPH/BPCA Level 2 Certificate in Pest Control *(2004 – 2010*')	RSPH/BPCA Level 2 Award in Pest Management *(2010 onwards)*	CRRU Wildlife Aware (accredited by BASIS) N.B. Approved in conjunction with current Wildlife Aware accreditation, as an update into approved status, for those holding approved 'grandfather' or 'current certification' issued before the dates shown in brackets
RSPH Level 2 Certificate in Pest Control *(2000 – 2004*')	RSPH/BPCA Level 2 Certificate in Pest Management *(2010 onwards)*	
RSH Certificate in Pest Control *(pre-2000 inclusive*')	RSPH Level 3 Diploma in Pest Management *(2010 onwards)*	
BPCA Diploma in Pest Control Part 1 (Previously 'BPC Diploma Part 1', 'RSH/BPC Certificate in pest control', 'BPC Diploma', 'Operators certificate of proficiency', 'British Pest Control Association Certificate in general pest control' and 'Certificate pre-1988') *(pre-2004 inclusive)*	City & Guilds NPTC Level 2 Award in the Safe Use of Pesticides for Vertebrate Pest Control for Rats and Mice (QCF) (PA 6&M) *(2013 onwards)*	
NPTC Level 2 Certificate of Competence in Vertebrate Pest Control (assessed in the context of rats and mice) *(2002 – 2014)*	LANTRA: Responsible and Effective Control of Commensal Rodents *(2015 onwards)*	
LANTRA: Rodent Control (previously Rat and Mouse Control) *(2009 – 2015)*	LANTRA: Rodent Control on Farms *(2015 onwards)*	
LANTRA: Rodent Control on Livestock Units *(2013 – 2015)*	Rat Control for Gamekeepers *(2015 onwards, through BASIS)*	
Killgerm Principles of Rodent Control (previously Killgerm Rodent Biology and Control) *(2004 – 2015)*	Killgerm Principles of Rodent Control *(2016 onwards, through BASIS)*	
	RSPH Level 2 Award in the safe use of rodenticides *(2015 onwards)*	
	BPCA Using Rodenticides Safely *(2015 onwards, exam through BASIS)*	
'RSH / RSPH certificates may bear a date up to two years after the end date stated above. These are still acceptable at the point-of-sale		
Note: The 'BPC Certificate of Proficiency *(1989 – 1994)*', 'BPCA Diploma Part II *(1995 – 2008)*' and 'BPCA Accredited Technician in Pest Control *(2008 onwards)*' are all accepted at the point-of-sale because other approved certification is a *prerequisite* for these.		

1. If you hold a certification / qualification listed under the 'Grandfather' or 'Current' headings and within the date range in brackets in the table, you already hold certification in line with stewardship requirements. You can purchase and use professional rodenticides labelled under stewardship requirements.

2. If you have completed a certification / qualification listed under the 'Grandfather' or 'Current' headings but did so before the date range in brackets, you need to update it. One option is the CRRU Wildlife Aware course with BASIS accreditation; other options are the courses listed under the 'Current' heading.

3. If you do not hold a certification / qualification listed anywhere in the table, you need to complete one of the courses listed under the 'Current' heading in order to demonstrate proof of competence at the point-of-sale.

Annex 6. Proposed Key Performance Indicators (KPIs) to be extracted from the results of successive KAP surveys to monitor changes in the use of anticoagulant rodenticides by professional users in the UK brought about by the implementation of the stewardship regime.

1. Qualifications: of all 2015 survey participants, 38 % claimed to have a formal qualification relating to decisions about rodent control; with values ranging between 19 % and 96 % for the different segments surveyed.

2015 Participants	Percentage claiming formal qualification
Arable Farmers	20 %
Livestock Farmers	19 %
Gamekeepers	37 %
PCO's	96 %
All Participants	38 %

2. Knowledge of Active Ingredient: of all 2015 survey participants, 34 % knew the active ingredient of their chosen formulation; with values ranging between 14 % and 96 % for the different segments surveyed.

2015 Participants	Percentage claiming knowledge of active ingredient
Arable Farmers	22 %
Livestock Farmers	14 %
Gamekeepers	21 %
PCO's	96 %
All Participants	34 %

3. Awareness of "Think Wildlife" 7 point code of practice: of all 2015 survey participants, 53 % were aware of the "Think Wildlife" 7 point code of practice; with values ranging between 41 % and 75 % for the different segments surveyed.

2015 Participants	Percentage claiming awareness of "Think Wildlife" code of practice
Arable Farmers	62 %
Livestock Farmers	41 %
Gamekeepers	51 %
PCO's	75 %
All Participants	53 %

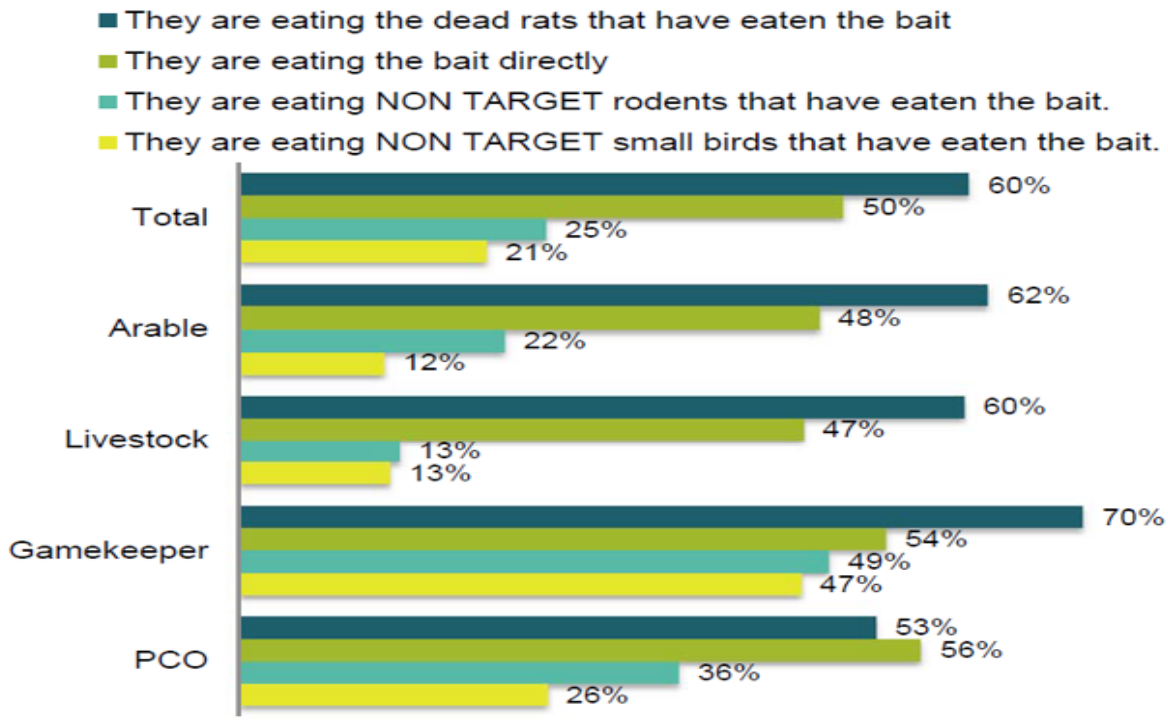
4. Awareness of "CRRU": of all 2015 survey participants, 18 % were aware of "CRRU"; with values ranging between 6 % and 58 % for the different segments surveyed.

2015 Participants	Percentage claiming awareness of CRRU
Arable Farmers	12%
Livestock Farmers	6%
Gamekeepers	9%
PCO's	58%
All Participants	18%

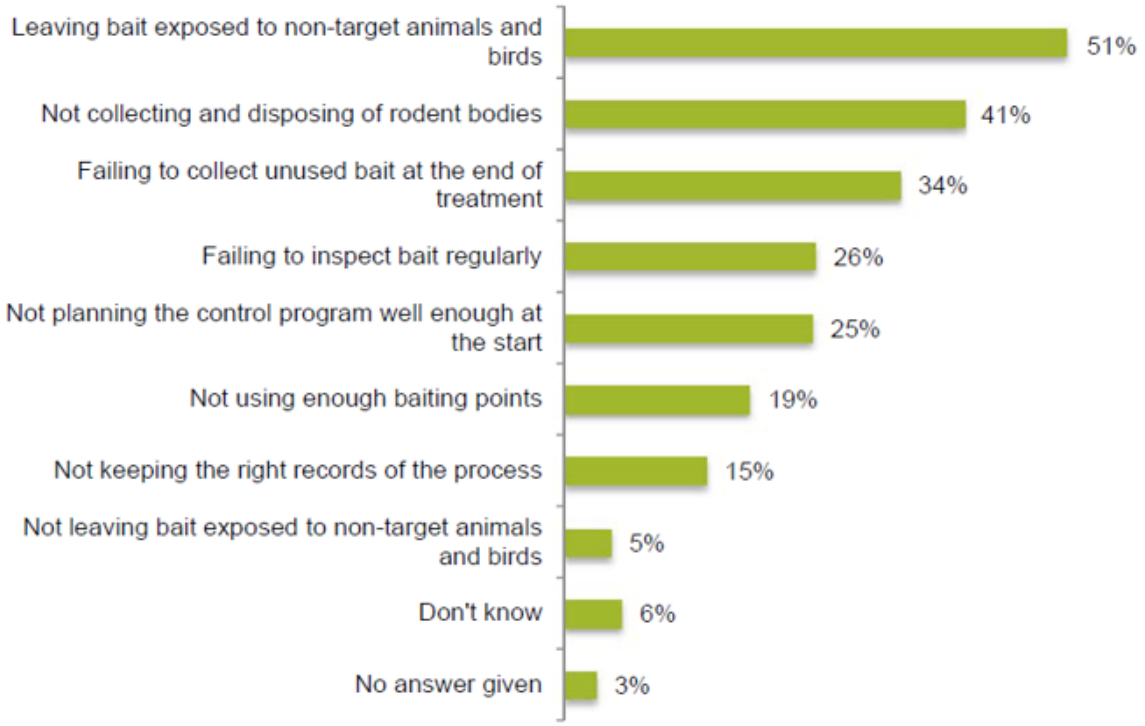
5. Awareness of the "UK Rodenticide Stewardship Regime": of all 2015 survey participants, 29 % were aware of the "UK Rodenticide Stewardship Regime"; with values ranging between 14 % and 56 % for the different segments surveyed.

2015 Participants	Percentage claiming awareness of UK Rodenticide Stewardship Regime
Arable Farmers	34%
Livestock Farmers	14%
Gamekeepers	30%
PCO's	56%
All Participants	29%

6. Contamination of non-target wildlife: for all 2015 survey participants, the main reasons expressed why rodenticides are found in non-target wildlife were:



1. Negative practices when using rodenticides: for all 2015 survey participants, the negative practices considered to pose the greatest risk to people and the environment were:



nb. The above can be analysed for each market Segment separately

2. Sourcing Information regarding safe and responsible use of rodenticides: of all 2015 survey participants, 60 % claimed to have sourced such information; with values ranging between 44 % and 93 % for the different segments surveyed.

2015 Participants	Percentage claiming to have sourced information regarding responsible rodenticide use
Arable Farmers	58 %
Livestock Farmers	44 %
Gamekeepers	65 %
PCO's	93 %
All Participants	60 %

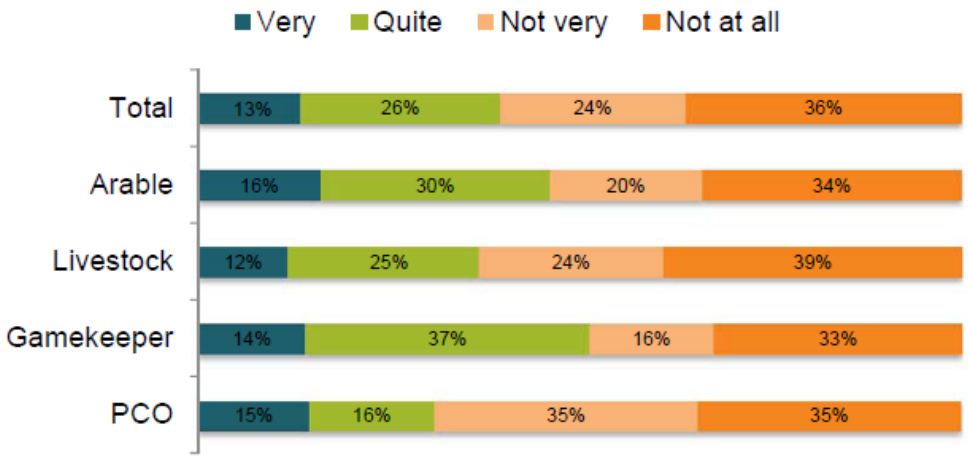
3. Impact of receiving this information (detailed in 8 above) on practice: of all 2015 survey participants, 48 % claimed to have changed their approach after receiving this information; with values ranging between 32 % and 61 % for the different segments surveyed.

2015 Participants	Percentage claiming an impact from receiving this information
Arable Farmers	45 %
Livestock Farmers	47 %
Gamekeepers	32 %
PCO's	61 %
All Participants	48 %

4. Attendance of training or seminars about responsible rodenticide use in the last 3 years; of all 2015 participants, 24 % claimed to have attended training or seminars in the last 3 years; with values ranging between 14 % and 71 % for the different segments surveyed.

2015 **Participants**	**Percentage claiming to have attended training / seminars in the last 3 years** **Ears** **yearsformal qualification**
Arable Farmers	16%
Livestock Farmers	9%
Gamekeepers	14%
PCO's	71%
All Participants	24%

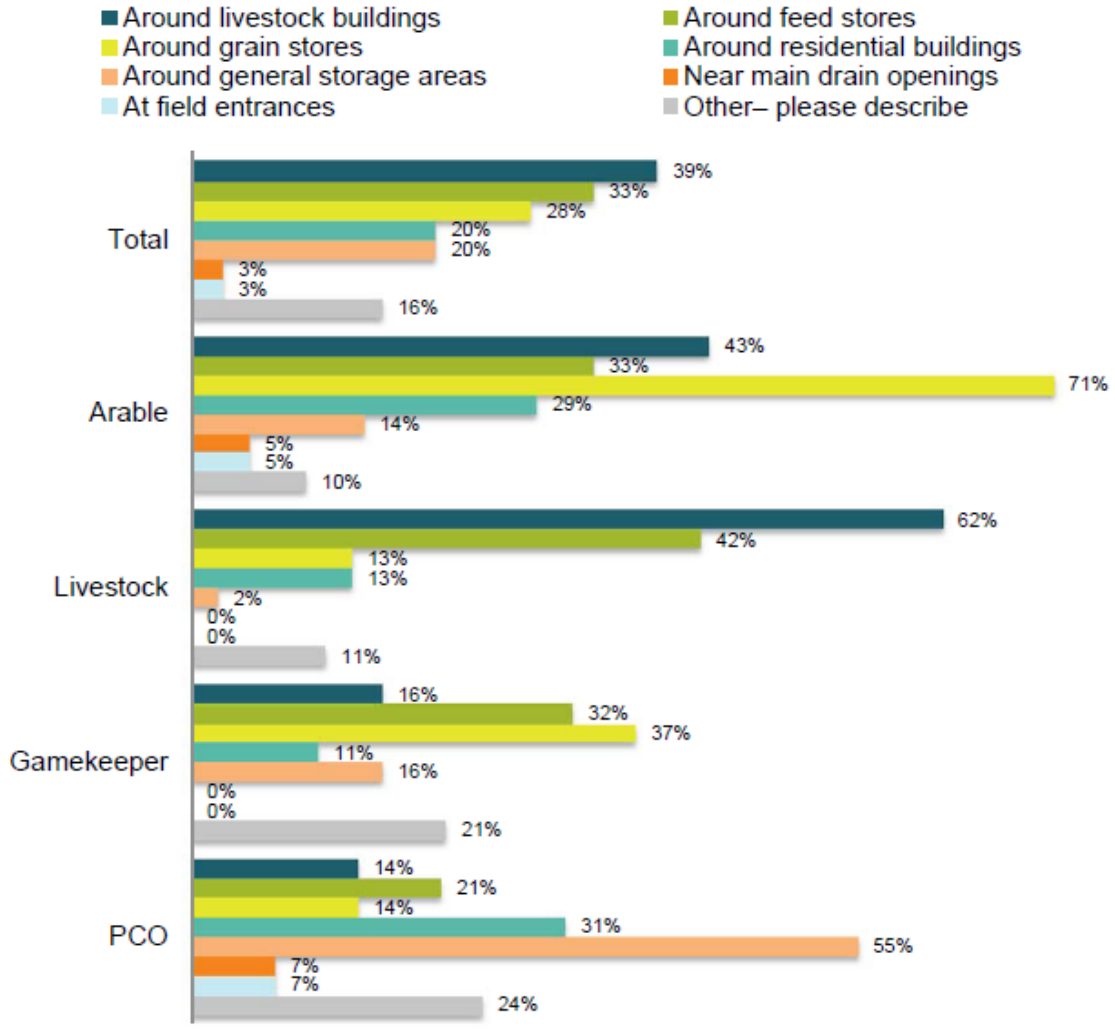
5. For all 2015 participants, the concerns raised about dealing with resistant rat populations were:



1. Employment of permanent baiting; of all 2015 participants, 43 % employed permanent baiting irrespective of whether there was a rodent problem; with values ranging between 38 % and 53 % for the different segments surveyed.

2015 Participants	Percentage claiming to use permanent baiting Ears yearsformal qualification
Arable Farmers	42 %
Livestock Farmers	38 %
Gamekeepers	44 %
PCO's	53 %
All Participants	43 %

2. For all 2015 participants, the locations where permanent baiting was used: presented in total and for each of the different segments surveyed.



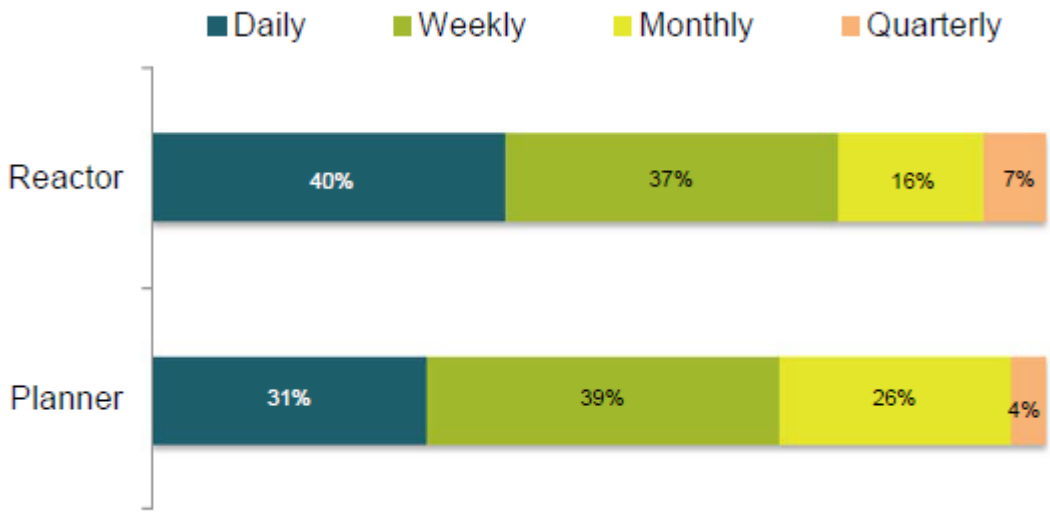
14 For all 2015 arable farmer, livestock farmer and gamekeeper participants, the proportion of treatments that are "Reactive" (in response to signs of activity) and "Planned" (following a management programme) were as follows:

2015 Participants	Reactive	Planned
Arable Farmers	36 %	64 %
Livestock Farmers	46 %	54 %
Gamekeepers	70 %	30 %
All Participants	42 %	58 %

nb. The view of PCO's were that was an approximate 50 % split between

"Reactive" and "Planned" activities.

15 For all 2015 arable farmer, livestock farmer and gamekeeper participants, the frequency of monitoring infestation levels for "Planned" and "Reactive" rat management were:



Annex 7. Published report of WIIS data 1993 to 2011

Monitoring Impacts of Vertebrate Pesticides in the UK: 1993 to 2011

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Introduction

Regulatory decisions are made about the suitability of a pesticide for the market after scrutiny of a dossier of studies covering, among other things, efficacy, physical-chemical properties, toxicology and ecotoxicology. It is important, however, once registration is granted, to operate a scheme of impact monitoring to enable modification of use patterns based on practical experience. Post-registration impacts of pesticides in the UK are monitored by the Wildlife Incident Investigation Scheme (WIIS) [1]. Incidents are admitted to the Scheme when there is evidence that a pesticide has caused an adverse effect on wildlife, companion animals, livestock or certain insects. The scheme has been operated by UK government scientists since 1985 and, since 1993, reports have been published with information on individual incidents.

Vertebrate pesticides are used in the UK for the management of a variety of pests including Norway rats (Rattus norvegicus), house mice (Mus musculus), grey squirrels (Sciurus carolinensis) and, formerly, moles (Talpa europea). One active substance, alphachloralose, is also used to narcotise birds. The majority of vertebrate pesticides used in the UK, however, are anticoagulant rodenticides. The necessity that vertebrate pesticides possess toxicity to mammals (and rarely birds) results in risks to wildlife. Therefore, non-target causalties of vertebrate pesticides comprise a substantial proportion of WIIS incidents. The Biocidal Products Directive (BPD) is benchmark European legislation published in 1998 to regulate vertebrate pesticides used as biocides [1]. The first products will come to the market in the European Union under its provisions in 2012. It appears timely, therefore, to review the impacts of vertebrate pesticides in the UK, prior to BPD implementation, so that potential ef

fects in reducing non-target casualties may be subsequently observed.

Materials and methods

The published annual reports of WIIS were examined and data transposed to a Microsoft Excel spreadsheet. Eight fields were used for each recorded incident: month and year of incident, active substance, species affected, number of individuals, type of casualty (i.e. wildlife, companion animal), whether primary or secondary poisoning was involved, location (county). Within WIIS, each incident is attributed to one of four categories as follows: approved use, misuse, abuse, unspecified. The latter category is used when an incident cannot be attributed to one of the others. During the early years of the Scheme an incident was admitted to the scheme only were obvious harm had been caused and confirmed by finding appropriate symptomology at post mortem and tissue pesticide residues. Latterly, and increasingly within the last 4 years, incidents are admitted where carcases of predatory birds and other wildlife are recovered without symptomolgy, or with other obvious causes of death such as starvation or trauma, but with low-level residues of second-generation anticoagulants. An analysis of WIIS data from 1993 to 2011 is presented here.

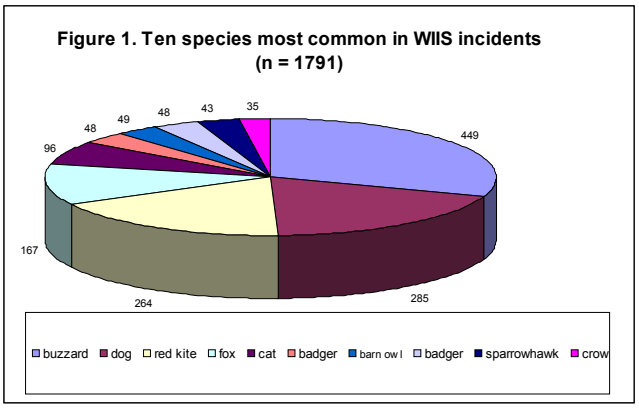
Results and discussion

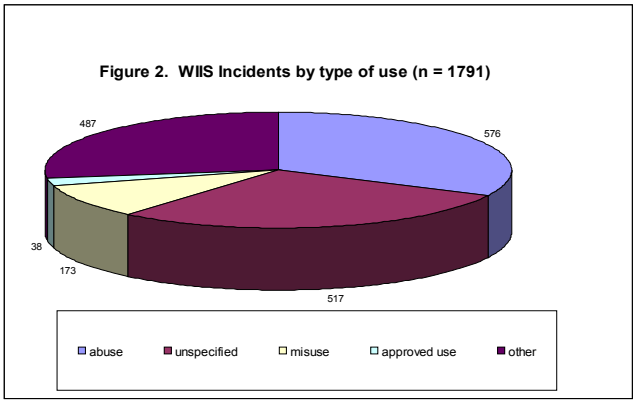
A total of 14 vertebrate pesticides was found to have been responsible for 1,791 WIIS incidents in the period. They are (number of incidents in brackets): bromadiolone (514), difenacoum (446), alphachloralose (370), brodifacoum (196), strychnine (89), coumatetralyl (82), warfarin (43), chlorophacinone (28), flocoumafen (9), sodium cyanide (5), aluminium phosphide (4), calciferol (3), coumarin (1), difethialone (1). Several of these active substances were withdrawn in 2006 as a result of the BPD review. Numbers of anticoagulant incidents are approximately proportional to volumes applied, with brodifacoum perhaps over-represented for reasons which are not readily apparent. A wide range of non-target species is involved in WIIS incidents (Figure 1).

Among predatory and scavenging birds, buzzards (Buteo buteo) and red kites (Milvus milvus) predominate. Of the 449 incidents involving buzzards the pesticide(s) found were not thought to have been the principal cause of death in 206 (45.9 %); the equivalent value for 264 red kites was 87 (33.0 %). Figure 2 shows the distribution of incidents according to type. Sub-lethal residues were found in 487 (27.2 %) incidents. The most common were abuse incidents, in which there was purposeful use of a pesticide to cause harm (576 incidents, 31.2 %).

The most frequent form of this type of incident was the use of alphachloralose put out in meat bait to kill corvids. Buzzards and red kites were often accidental victims in these cases. A further 173 (9.7 %) incidents are caused by pesticide misuse. Only 38 (2.1 %) incidents, and none within the last 3 years, were caused when pesticides were used according to label instructions. A large number of incidents could not be allocated to one of these three categories (n=517, 28.9 %), and many of these involved anticoagulants.

These active substances have a chronic mode of action and casualties are often found far from the location of exposure, making causal investigation difficult. However, there is no reason to suspect that these incidents are distributed between the three other types (abuse, misuse, approved use) in a proportion that is different from those for which a cause is found. If the 'unspecified' incidents are allocated for in the same proportion, we arrive at a total of 98 approved use incidents over the 19-year period of the analysis. This low level affords some confidence that, used according to label instructions, vertebrate pesticides, including anticoagulant rodenticides, pose no significant acute risk to non-targets in the UK.





A criticism sometimes levelled at the WIIS is that it under-records incidents. This is obviously true as there is no doubt some casualties are not found. But, with more than 32 years of continuous WIIS operation, it would have been apparent if there was a failure to detect a major impact on an important wildlife species. It may be significant that populations of the two species of predatory/scavenging birds most frequently found in WIIS incidents, buzzard and red kite, are currently expanding rapidly in the UK.

There is no room for complacency, however, because other studies such as those conducted by the UK Predatory Bird Monitoring Scheme (PBMS) show that exposure of wildlife to anticoagulants in the UK is widespread [3]. Mitigation is required urgently to reduce this contamination [4]. Schemes such as WIIS and PBMS will be important in monitoring impacts of pesticides as the European Commission's Sustainable Use Directive (SUD) [5] is implemented. Within the SUD, a system of risk indicators is applied so that the benefits of the legislation are apparent in the improved health of man and the environment. Monitoring schemes such as WIIS, clearly offering direct and specific risk indicators, will play an important part.

Conclusions

The operation of the WIIS is an important measure for monitoring impacts of pesticides on non-target wildlife and companion animals in the UK. Incidents caused by verte-

brate pesticides mainly involve wildlife crime. The rarity of incidents occuring when vertebrate pesticides are used correctly affords some confidence that current use patterns are broadly correct. However, the frequency and breadth of wildlife incidents involving the anticoagulant rodenticides, and widespread low-level residues, is a continuing concern that requires vigilence and the rigorous application of a range of mitigation measures [4].

References

[1] European Community 1998. Directive 98/8/EC of the European Parliament and of the Commission of 16 February 1998 concerning the placing of biocidal products on the market. Official Journal of the European Communities L 123/1: 63 pp.

[2] Health and Safety Executive 2010. Wildlife Incident Investigation Scheme. http://www.pesticides.gov.uk/environment.asp?id=58. Accessed 25.11.11.

[3] Walker LA, Llewellyn NR, Peréira MG, Potter ED, Sainsbury AW and Shore RF 2010. Anticoagulant rodenticides in predatory birds 2009: a Predatory Bird Monitoring Scheme (PBMS) report. Centre for Ecology & Hydrology, Lancaster, UK. 17pp.

[4] Campaign for Responsible Rodenticide Use 2011. http://www.thinkwildlife.org.uk. Accessed 25.11.11.

[5] European Community 2009. Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the sustainable use for Community action to achieve sustainable use of pesticides. Official Journal of the European Communities L 309/71: 16 pp.

Annex 8. Examples of published materials produced to support stakeholder communications and information dissemination.

THINK WILDLIFE

Campaign for Responsible Rodenticide Use

CRRU Stewardship