

(Projects funded under the Call 2014 onwards must use this format)



LIFE14 NAT/UK/000467

Final Report

Covering the project activities from 01/11/2015 to 31/03/2020

Reporting Date

22/06/2020

SciuriousLIFE (Red Squirrels United)

Data Project

Project location:	United Kingdom
Project start date:	01/11/2015
Project end date:	31/12/2019 Extension date: 31/03/2020
Total budget:	€ 2,699,565
EU contribution:	€ 1,619,741
(%) of eligible costs:	60%

Data Beneficiary

Name Beneficiary:	Royal Society of Wildlife Trusts
Contact person:	Ms Cath Hare
Postal address:	The Kiln, Mather Road, Newark, Nottinghamshire, NG24 1WT, UK
Telephone:	+44 (0) 1636 670083
E-mail:	
Project Website:	https://www.redsquirrelsunited.org.uk

Contents

- 1. **List of key-words and abbreviations** 3
- 2. **Executive Summary (maximum 2 pages)**..... 4
- 3. **Introduction (maximum 2 pages)** 6
- 4. **Administrative part (maximum 1 page)**..... 8
- 5. **Technical part (maximum 25 pages)** 9
 - 5.1 **Technical progress per Action** 9
 - 5.2. **Main deviations, problems and corrective actions implemented** 29
 - 5.3. **Evaluation of Project Implementation** 30
 - 5.4. **Analysis of benefits** 31
- 6. **Key Project-level Indicators**..... 35

1. List of key-words and abbreviations

AB	Associated beneficiary
APHA	Animal and Plant Health Agency
BES	British Ecological Society
CB	Coordinating beneficiary
CBA	Cost Benefit Analysis
CLL	Community Learning Lab
CRST	Clocaenog Red Squirrel Trust
DEFRA	Department of Environment, Food and Rural Affairs
EASME	Executive Agency for Small and Medium-sized Enterprises
ER	Expected Result
ERG	Evidence Review Group
ERS	Ecological Research Services
ESI	European Squirrel Initiative
EU	European Union
EWRR	Early Warning and Rapid Response
FC	Forestry Commission
FR	Forest Research
FTE	Full Time Equivalent
GBNNSS	Great Britain Non-Native Species Secretariat
IAS	Invasive Alien Species
IUFRO	International Union of Forest Research Organisations
LWT	Wildlife Trust for Lancashire, Manchester and North Merseyside
NI	Northern Ireland
NIEA	Northern Ireland Environment Agency
NISF	Northern Ireland Squirrel Forum
NLHF	National Lottery Heritage Fund
NRW	Natural Resource Wales
NU	Newcastle University
NUI	National University Ireland
NWT	Northumberland Wildlife Trust
PAG	Project Advisory Group
PCR	Polymerase Chain Reaction
PDRA	Postdoctoral Research Assistant
PMB	Project Management Board
ROI	Republic of Ireland
RSNE	Red Squirrels Northern England
RSTW	Red Squirrels Trust Wales
RSU	Red Squirrels United
RSWT	Royal Society of Wildlife Trusts
SAC	Special Area Conservation
SQPV	Squirrelpox virus
SSRS	Saving Scotland's Red Squirrels
TLS	Trap Loan Scheme
UW	Ulster Wildlife
WTSWW	The Wildlife Trust of South and West Wales

2. Executive Summary (maximum 2 pages)

RSU brought together partners from across the UK to look at evolving IAS management techniques for grey squirrel control and red squirrel conservation. RSU had four overall objectives:

- Tackling IAS Colonisation Prevention
- Developing Rapid Response/Early Warning approaches
- Maximising the impact of control/eradication approaches
- Aiding the development of comprehensive IAS management frameworks

Delays in securing match funding impeded the start of the project and a three-month prolongation request was approved by EASME in October 2019 moving the project end date to 31 March 2020. This allowed RSU to fully conclude project actions, adding value to deliverable outputs and impact. Overall the project was highly successful achieving all its objectives and exceeding many of its targets. RSU demonstrated an excellent return on the investment of public funding following an independent cost benefit analysis evaluation. This found that RSU generated total benefits of £11.5 million against a budget of approx. £3 million based on social, ecological and economic factors over the lifetime of the project. This represented excellent value for money and highlighted the importance of landscape scale partnership collaborations. Across project areas red squirrel populations remained stable and increased distribution in some areas and in 2019 the species was reclassified as a species of ‘Least Concern’ from ‘Near Threatened’ on the Irish Red List for Terrestrial Mammals. Undoubtedly the activities conducted through RSU in Northern Ireland made a significant contribution to this reclassification.

Tackling IAS colonisation prevention

The island of Anglesey was declared grey squirrel free in 2013 following an intensive campaign to remove them. Through RSU, Anglesey was successfully protected from recolonisation by extensive control of grey squirrel populations on the Gwynedd mainland. A community based early warning system was established across the island to detect grey squirrel incursions and monitor the general visual health of the red squirrel population. Two grey squirrels were detected on the island in 2017 and immediately removed by AB RSTW. RSTW also worked with AB UW developing a sea traffic protocol with inputs from ferry company Stena to prevent IAS such as grey squirrels being incidentally transported by sea traffic. Grey squirrel control was carried out by AB NWT and community groups across the Kielder Forest red squirrel stronghold complex in northern England to prevent colonisation by grey squirrels. Grey squirrels were regularly detected around the fringes of Kielder and Kidland forests and it was challenging to respond quickly to reported sightings due to the resources available and the time and distances involved. NWT addressed this by incentivising local community groups through financial support and increasing the number of volunteers undertaking grey squirrel control. Overall, the forests were protected from grey squirrel colonisation.

Developing rapid response/early warning approaches

EWRR systems were implemented across all project areas. RSTW only partially established the early warning system in Gwynedd as grey squirrels were not eradicated from the target area. However, grey squirrel populations were suppressed, and community awareness of IAS issues was significantly raised. Population density is very low in the remote Kielder Forest stronghold and motion sensing cameras were the primary early warning mechanism in the EWRR system implemented by NWT. This focussed on 52 sites identified as key points for grey squirrel incursion and in July 2019, the surveys were 96% delivered by volunteers surpassing the C4 action target of 75%.

Maximising the impact of control/eradication approaches

Eradication of grey squirrels from the Mourne Plains in NI carried out by UW was broadly successful. UW established a community led EWRR network to respond to incursion threats and these community groups will lead the effort to prevent grey squirrel re-incursion post project. AB LWT guided the Red Alert volunteer group to become constituted and increased membership of the urban TLS by 145%. AB NU gathered grey squirrel control data from all project areas, developed bespoke models for each area and produced recommendations for future IAS management projects.

The attempt to eradicate grey squirrels from 1,500 hectares of woodland habitat within 165km of northern Gwynedd was not successful. Delays in securing RSTW contractors meant grey squirrel control did not commence in earnest until February 2017, rather than January 2016 and the problem was further exacerbated by bumper autumn seed crops in 2016. RTW implemented the C2 contingency and produced a quantification of resources necessary to eradicate grey squirrels from a 90km² area of northern Gwynedd, commissioned genetic analysis of culled grey squirrels building understanding of local and migratory pressures and focussed on the introduction of captive bred pine martens (*Martes martes*) to act as a biological suppressant.

Aiding the development of comprehensive IAS management frameworks

Four Knowledge Fairs were hosted over the lifetime of the project representing a unique opportunity to bring together stakeholders from across the IAS sector in the UK and Europe to share knowledge, best practice and build connections. RSU liaised and collaborated with 14 LIFE and 12 non-LIFE projects contributing to the broader IAS management community across the UK and Europe. Three written best practice guides were published along with 29 best practice videos and nine webinars. Four Layman's reports were produced and all resources are available on the [RSU Website](#).

Research conducted by AB FR demonstrated that awareness of red squirrels and issues posed by grey squirrels was higher in areas where red squirrel populations are present. Two papers were published in academic journals under Action E3 with a further one submitted (in review) at the end of the project. Although the target of four papers published was not achieved within the project timeframe, several papers that RSU partners co-authored were published adding value to the overall project. Following consultation with stakeholders the AfterLIFE plan was produced and a public facing element of this was combined with the final Layman's report and disseminated at the 2020 Knowledge Fair. RSU achieved strong media coverage throughout the project at the national and regional levels including several appearances on national TV programmes such as BBC Countryfile and Springwatch.

Working as a partnership greatly enhanced RSU delivery amplifying project outcomes and outputs and facilitating knowledge sharing, lesson learning and best practice across the broader IAS community. Several novel approaches were pioneered through RSU including the use of red squirrel detection dogs, the Kania 2000 trap in conjunction with a live capture trap for grey squirrel management and non-invasive techniques for infection detection. Many of these approaches began with one partner and through collaborative working migrated across the partnership, community groups and the IAS community. The global outbreak of Covid-19 and the subsequent UK lockdown has meant much of the activity documented in the AfterLIFE plan has come to a standstill. Activity will resume when lockdown measures are relaxed but it is likely that the lack of/or reduced grey squirrel control and surveillance will have negatively impacted project areas.

3. Introduction (maximum 2 pages)

The Eastern grey squirrel (*Sciurus carolinensis*) is a well-established and well-known example of an IAS in the UK. First introduced to the UK from North America in 1876, there is now an estimated population of more than 2.5 million. Meanwhile, the native Eurasian red squirrel (*Sciurus vulgaris*) population has declined to approximately 140,000 and they have been extirpated from much of their native range across the UK. This is due to inter-specific resource competition and the transmission of a pathogenic squirrelpox infection from grey squirrel to red squirrel. Grey squirrels carry this disease with virtually no ill effects to themselves, but it is invariably fatal when transmitted to red squirrels causing epidemic disease and accelerating red squirrel population decline.

Grey squirrel management has a long history in the UK, dating back to the first legislation recognising their invasive potential in 1933. RSU aimed to increase the understanding of how to effectively manage grey squirrels to achieve red squirrel conservation objectives and develop best practice implementation methods. This included increased knowledge of how to better instigate and maximise the efficacy of control programmes sufficient to restore habitats for recolonisation by red squirrels. Evidence shows that grey squirrel management requires involvement from woodland managers and wider communities to be effective and RSU aimed to increase community participation and voluntary groups. Without multi-partnership, landscape scale collaborations, local grey squirrel control efforts can be ineffective. Creating and enacting shared management strategies at an appropriate scale helped to achieve conservation objectives and long-term community engagement.

The overall and specific project objectives were as follow:

Tackling Invasive Alien Species colonisation prevention:

1. Development of mechanisms to prevent the unintentional introduction of grey squirrels to currently uncolonised woodland landscapes
2. Development of early warning/rapid response mechanisms to ensure a 720km² island from which grey squirrels have recently been eradicated is not recolonised.

Developing rapid response/early warning approaches:

3. Development of rapid response mechanisms to mitigate the impacts of grey squirrels in urban woodlands with higher biodiversity and tourism value
4. Development of early warning systems to detect grey squirrels in sparsely populated rural landscapes.

Maximising the impact of control/eradication approaches:

5. Development of more efficient strategic mechanisms to evolve community based grey squirrel management in the UK
6. Quantification of the financial and community-based resources needed to achieve regional eradication of an IAS which has been present in the UK since 1876.

Aiding the development of comprehensive IAS management frameworks:

7. Sharing the learning associated with this project with other IAS management programmes across the EU
8. Using knowledge exchange and trust building processes to aid the development of a broader IAS management community across the UK

9. Testing the impact of measures to increase public awareness and community capacity associated with grey squirrel IAS management in and beyond geographical activity centres included in this project
10. Informing the development of long term and comprehensive management frameworks for grey squirrels in the UK.

These objectives were met through the delivery of preparatory, conservation, dissemination, evaluation and project management actions.

RSU was underpinned by scientific and social research; working with community groups and volunteers to protect 11 (of which two were funded through National Lottery Heritage Fund only) strong-hold red squirrel populations in the following delivery locations:

Northern Ireland

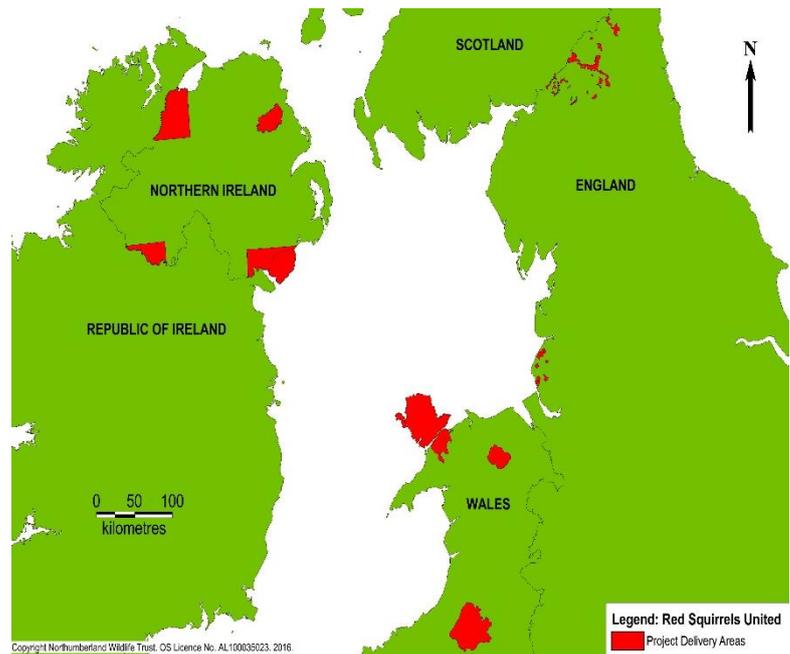
- Glens of Antrim
- Mourne mountains
- Fermanagh
- North West

Wales

- Anglesey and Gwynedd
- Clocaenog (NLHF only)
- Tywi (NLHF Only)

Northern England

- Kielder
- Uswayford
- Kidland
- Merseyside



Longer term results for RSU were as follows:

- 156,890ha of woodland targeted with grey squirrel control
- Overall stable populations of red squirrels in targeted areas with good/favourable conditions for population increase
- 1,730 members of groups looking at the conservation of red squirrel habitats
- 15 full time equivalent jobs created (10 continuing beyond lifetime of the project)

4. Administrative part (maximum 1 page)

The RSU partnership was managed by the RSWT, the CB for the project. There were several personnel changes throughout the project most notably with the CB when two programme managers resigned (July 2017, February 2018). The third programme manager remained in post to the end of the project. The project was managed through the PMB constituted from the CB and AB's which met face-to-face at least twice per year and held monthly teleconference calls. Additionally, the PAG provided advice and support to the PMB on the strategic direction of the project and the broader IAS landscape. The PAG convened twice per annum.

There were no significant deviations from the workplan although the delay in securing co-financing and subsequent activity meant the project was running approximately six months behind schedule. RSU recovered most of this time throughout the project and a three-month project prolongation request to amend the project end date to 31 March 2020 was submitted and accepted by EASME in October 2019. Objectives were deemed viable throughout the project and these were achieved. However, elements of the project were amended at the activity level including changes to staffing and minor adjustments to planned activity. These were all communicated to the NEEMO monitor and EASME via project progress reports who deemed such amendments acceptable.

Five Mission meetings took place throughout the project with the NEEMO monitor. The final Mission meeting in February 2020 was also attended by EASME. Updates on project progress were given by all partners and the NEEMO monitor and EASME attended site visits at all Missions. Feedback received from EASME following submission of all progress reports and the midterm report was addressed.

5. Technical part (maximum 25 pages)

5.1 Technical progress per Action

A1: North Merseyside management planning (LWT)

Foreseen start date: 11/2015

Actual start date: 04/2016

Foreseen end date: 12/2015

Actual end date: 09/2016

Description of activities and comparison with planned output

Job descriptions and adverts were drawn up and posts advertised by the end of July 2016 to achieve the Expected Result (ER) of two new staff recruited. Recruitment material was prepared and an induction plan for both new post holders was drawn up planning their first six weeks of work. This included LWT training and induction procedures, meeting with key stakeholders and starting Action C1. Both the Red Squirrel Ranger and Community Engagement Officer posts commenced on 12 September 2016 rather than December 2015 as originally planned due to the delay in securing match funding.

An event to inform key stakeholders about the project commencement was held on 27 July 2016 at St Michael's Church, Crosby. All landowners known within the project area were invited by email, telephone or post. Posters were also put up in local businesses and the event was advertised through social media (LWT Facebook and Twitter). The event was successful with 18 attendees consisting of local landowners and volunteers as well as members of the public. A short presentation detailing the current state of red squirrel conservation and the aims of RSU was delivered. This was followed by an opportunity to network and ask questions. Information boards were displayed detailing the aims and objectives of the project and how landowners and volunteers could get involved. All expected results and milestones were achieved by September 2016. No deliverable outputs were due from this action.

Any modifications and EASME correspondence

No modifications or EASME correspondence against this action.

Major problems and delays

There were delays in recruiting staff as match funding was not confirmed until May 2016.

Complementary actions outside LIFE

Not applicable to this action

Continuation of action after funding ends

The staff employed through this preparatory action continued to work on action C1 and other cross cutting project actions.

A2: Island colonisation prevention management planning & tissue sampling protocol (RSTW)

Foreseen start date: 11/2015

Actual start date: 11/2015

Foreseen end date: 12/2015

Actual end date: 08/2016

Description of activities and comparison with planned outputs

A2 ER strategic regional conservation report Shuttleworth & Halliwell (2016) *'Red Squirrel (Sciurus vulgaris) Conservation Plan for Anglesey and Gwynedd (Annex A2.1)* was produced in parallel with *'Proactive and reactive contingency plan'* (Action C2 deliverable) two strategic contingency documents that underpinned Action C2.

The illustrated step by step guide and A2 ER and deliverable *'Grey Squirrel Tissue Sampling Protocol'* (Annex A2.2) described the replicable techniques for harvesting tissue, blood and hair from grey squirrel carcasses. It listed alternative approaches, the equipment required and highlighted risk to ensure that standardised tissue collection could be undertaken safely. In parallel, a short paper Shuttleworth et al. (2016) *'Understanding how grey squirrel infections impact upon native wildlife and domestic animals.'* (Annex A2.3) described the pattern of tissue sampling required for meaningful power analysis of test results. Most expected results, deliverables and milestones were achieved by August 2016. Appointing contractors was delayed until February 2017, rather than January 2016 due to the delay in securing co-financing and the requirement to follow the OJEU process.

Any modifications and EASME correspondence

None under this action

Major problems and delays

None under this action

Complementary actions outside LIFE

RSTW provided data from the earlier island eradication for parallel modelling undertaken by University of Heriot-Watt, Jones et al. (2017) *'Mathematical models for invasive species management: Grey squirrel control on Anglesey.'* Ecological Modelling 359:276–284 that predicted reinvasion rates and potential epizootic consequences in native red squirrel (Annex A2.4).

Following initial development of the Grey Squirrel Tissue Sampling Protocol, two scientific papers were published (1) Everest et al. (2019) *'Assessing a potential non-invasive method for viral diagnostic purposes in European squirrels.'* Hystrix doi:10.4404/hystrix-00128-2018 (Annex A2.5) (2) Shuttleworth et al. (2019) *'Detecting viral infection in red squirrels.'* Veterinary Record 184:507 (Annex A2.6) that described the novel non-invasive approach of using squirrel hair as a source material to detect viral infections. Development of the non-invasive approach in the project lifetime was used to inform the Grey Squirrel Tissue Sampling Protocol resulting in stronger overall outputs.

Continuation of action after funding ends

Outputs from this action were used to inform Action C2, and other cross cutting project actions.

A3: Northern England Management Planning and Grey Squirrel Management Recording Protocol Preparation (NWT)

Foreseen start date: 11/2015

Actual start date: 05/2016

Foreseen end date: 12/2015

Actual end date: 10/2016

Description of activities and comparison with planned output

Discussions between NWT and NU began in December 2015 to scope potential methodologies for the development of an early warning detection system to detect grey squirrels around the Kielder Forest stronghold. NWT continued to develop these methodologies early in 2016, resulting in the achievement and production of the A3 ER and deliverable *Northern England management planning and grey squirrel management recording protocol* (Annex A3.1). This management plan and protocol outlined methods that would be used to track grey squirrel arrivals in the area using trail camera monitoring in approximately 50 sites within 2km of the main forests.

The protocol for recording data continued to evolve during 2016 as per the ER to develop a grey squirrel management recording protocol for actions C1-C4. This proved to be a lengthy process involving discussions between NWT and NU but by October 2016 the A3 deliverable proforma was agreed and implemented (Annex A3.2).

Two red squirrel rangers were recruited by NWT to deliver grey squirrel management. These posts began on 4 July 2016. A third person was in post by end September 2016. All ER's were achieved by October 2016.

Any modifications and EASME correspondence

No modifications or EASME correspondence against this action.

Major problems and delays

There were delays in recruiting staff as match funding was not confirmed until May 2016. There were initially issues agreeing a format between NU and NWT to record data that was both practical (user-friendly) and technical enough to capture all the data required for modelling and analysis. However, this was resolved and although the new recording form was more complex than any previously used by NWT, the rangers adopted it following training sessions, and were able to capture data that reflected their fieldwork in a more complete and error-free way.

Complementary actions outside LIFE

NWT also delivers the RSNE project.

Continuation of action after funding ends

The staff employed through this preparatory action continued to work on action C1 and other cross cutting project actions.

A4: Northern Ireland Management Planning Completion (UW)

Foreseen start date: 11/2015

Actual start date: 05/2016

Foreseen end date: 12/2015

Actual end date: 10/2016

Description of activities and comparison with planned output

To achieve the ER 'year one NI grey squirrel management and monitoring plan completed', UW contracted two external consultants to design a new squirrel monitoring programme for Ulster and put together a management plan by end of June 2015. This report was used to decide which areas would be most appropriate for the project to focus on and assess how many staff were needed.

NUI Galway and Queens University completed their contracts to create least cost pathways for grey squirrel distribution across the entire province by end January 2016. From this modelling they created A4 deliverable grey squirrel control strategy for identified landscapes (Annex A4.1). Queens University created A4 deliverable grey squirrel management and monitoring strategy (Annex A4.2) on the presence and absence of grey and red squirrels across Northern Ireland, and to monitor the eradication efforts in the Mourne Mountains. They identified 120 woodlands as part of a constant effort survey to be monitored over the lifetime of the project by UW.

A full staffing complement for the project was in place by end August 2016 achieving the ER 'Four new staff are recruited to deliver Action C4'. Based on discussions with Galway University, refinements were made to the structure and location of the delivery team as detailed in the modifications section below. A total of four staff were originally planned and five were recruited with the total FTE remaining at four. All ER's, milestones and deliverable outputs were achieved for this action.

Any modifications and EASME correspondence

The original bid proposed two Rangers and two Community Engagement Officers. However, to maximise impact, increase efficiency, reduce travel time and cost, a variation to the original delivery model was proposed. This was to recruit three-part time community engagement officers (making up two FTE posts) at locations suggested by Galway University as opposed to the original two posts. This change was discussed with the NEEMO Monitor and agreed in January 2016.

Major problems and delays

There were delays in recruiting staff as match funding was not confirmed until May 2016.

Complementary actions outside LIFE

UW continued to build links with the NISF and attended meetings to talk about the RSU project.

Continuation of action after funding ends

The staff employed through this preparatory action continued to work on action C1 and other cross cutting project actions.

A5: Preparation of a socio-economic evidence baseline (FR)

Foreseen start date: 11/2015

Actual start date: 11/2015

Foreseen end date: 12/2015

Actual end date: 10/2016

Description of activities and comparison with planned output

FR was responsible for socio-economic monitoring and evaluation of the project. To achieve the ER 'Socio-economic evidence baseline report compiled and shared' a nationwide survey of public stakeholders in the UK was conducted in 2015 to generate primary data on public attitudes to specific methods used to manage grey squirrel populations. Questions concentrated on four key areas: (i) general interest and involvement in nature woodlands; (ii) attitudes towards wildlife; (iii) attitudes towards management methods for grey squirrels; and (iv) opinions about who should take responsibility for management, and who is trusted to perform certain key management tasks. FR carried out a two-part survey with a national overview and a boost sample within and around case study areas.

A draft summary report was produced in November 2015 and circulated to RSU partners for inputs. The final version of the report, A5 deliverable Public Attitudes Survey Summary Report (Annex A5.1) established an evidence baseline on attitudes, perceptions and opinions held by communities on grey squirrel management.

FR visited North Merseyside (August 2016), Northumberland and Ulster (September 2016) and Wales (October 2016). These visits were the start of evaluating impacts of the project on volunteer and community beliefs, attitudes and motivation.

The ER 'an evidence database that RSU partners could electronically add evidence too, building socio-economic evidence' was achieved. A formal database that partners could directly input into was not established as it was more straightforward for data management purposes if AB's provided data to FR to hold centrally. However, evidence was continually provided to FR from partners through team, stakeholder, landowner and community interviews, CLL's, ERG's and PMB meetings and this data was held and managed centrally by FR.

All expected results, deliverables and milestones were achieved.

Any modifications and EASME correspondence

None under this action

Major problems and delays

As there were delays in partners recruiting project staff and starting volunteer programmes, FR delayed visiting project areas until match funding and staff were in place. Visits to project areas were conducted between August and October 2016.

Complementary actions outside LIFE

Other complementary research that FR was leading or had a role, was on "Community attitudes towards pine marten reintroduction in Forest of Dean".

Continuation of action after funding ends

FR continued socio-economic evaluation through the lifetime of the project under Action D2.

A6: Preparation of ecosystem restoration assessment baseline (NU)

Foreseen start date: 01/2016

Actual start date: 01/2016

Foreseen end date: 09/2016

Actual end date: 10/2016

Description of activities and comparison with planned output

A PDRA was recruited by NU and started in January 2016. The first phase of the project involved visiting the project partners and collating all existing ecosystem-based data for each project area. The PDRA worked with the historical data to align formats into a generic database achieving the ER 'A database (or series of linked databases) of historic ecosystem-based data for each project area'. This dataset was used to develop methodology for spatial analysis of the grey squirrel cull records which could then be used to assess past control distribution in the project areas and provide a baseline for the project. During this process NU highlighted differences in the quantity and the quality of the gathered data used by different partners. This assisted early identification of data gathering and assessment problems.

Research determined the best analytical tools to model and evaluate conservation action data. This reviewed scientific literature databases for studies with similar objectives and by reviewing relevant statistical modelling methodologies e.g. population dynamics tools, occupancy modelling methodologies and spatially explicit removal models. The researcher decided no off-the-shelf model could be applied to the project data. NU designed model structures needed to achieve the monitoring and evaluation in Action D3.

The global modelling framework, data recording protocols, and basic model structures were presented in A6 ER and deliverable ecosystem restoration assessment baseline report (Annex A6.1) which was shared with all project partners in 2016. All ER's, milestones and deliverable outputs were achieved for this action.

Any modifications and EASME correspondence

None under this action

Major problems and delays

There were no issues with this element of the project.

Complementary actions outside LIFE

NU worked with RSTW to assess a pilot study of a Magnum trap, which resulted in a scientific manuscript published in International Journal of Pest Management (Annex A6.2) in December 2016.

Continuation of action after funding ends

NU continued to design the model structures required to achieve the monitoring and evaluation in Action D3.

A7: Project initiation, communications and protocol preparation (RSWT)

Foreseen start date: 11/2015

Actual start date: 11/2015

Foreseen end date: 12/2015

Actual end date: 10/2016

Description of activities and comparison with planned output

RSWT sent start-up instructions to all associated beneficiaries (ABs) reconfirming timelines for preparatory actions, guidelines for letting contracts, advertising new roles and keeping appropriate financial records in February and April 2016. Partnership agreements were sent to all ABs in December 2015 and returned to the CB by January 2016 (Annex A7.1) achieving the ER 'Project initiation processes are completed to the satisfaction of funders and beneficiaries'

A basic communications protocol was circulated by end October 2016, to all project beneficiaries to provide guidance on how to use the RSU project brand. The full A7 deliverable communications and engagement protocol (Annex A7.2) was revised, finalised and agreed in September 2017 achieving the ER 'A communications protocol is consulted on, agreed and adopted by Sciuriosity beneficiaries in the last quarter of 2015'.

Recruitment to the CB team began in April 2016. A Programme Manager started with RSWT on 1 August 2016. The post of Project Officer was advertised twice, and after careful review of the job description and advert to appeal to a wider audience, it was re-advertised on 8 August 2016. RSWT shared the advert with another LIFE14 project, MoorLIFE2020, and with its wider network, including RSU partners. A Project Officer was successfully recruited and started work on 17 October 2016 achieving the ER 'Both RSWT secretariat staff posts are appointed on schedule in the last quarter of 2015'.

All expected results and deliverable outputs were completed for this action.

Any modifications and EASME correspondence

There were no modifications to the elements of this action.

Major problems and delays

Delays in securing match funding led to late recruitment of CB staff which also delayed production of the communications protocol.

Complementary actions outside LIFE

RSWT managed the NLHF element of the RSU project which included an additional partner, WTSWW, and additional areas (Clocaenog Forest in north Wales (RSTW) and the Tywi Forest (WTSWW) in mid-Wales).

Continuation of action after funding ends

CB services continued under actions D1, E1, E2, F1, F2, F3 and F4.

C1: Urban IAS grey squirrel management in North Merseyside (LWT)

Foreseen start date: 10/2016

Actual start date: 09/2016

Foreseen end date: 12/2019

Actual end date: 12/2019

Description of activities and comparison with planned output

Red squirrel range and density across the coastal reserve woodlands remained stable overall despite sporadic outbreaks of squirrelpox virus in the Formby area in 2018 and 2019. 2019 monitoring results indicated that red squirrels had returned to 90% of 2002 levels¹ with the highest ever numbers of red squirrels recorded in autumn 2018 at Ainsdale Nature Reserve.

LWT undertook grey squirrel control throughout the identified priority woodlands, and this work complimented the urban grey squirrel management undertaken by seven volunteers in the towns. LWT successfully guided the volunteers through the process of becoming a constituted volunteer group – Red Alert (Lancashire & Merseyside) and they have so far achieved a membership of 31 individuals. ER's for new members of grey squirrel volunteer control networks were not met although volunteer participation in the urban TLS increased across the four areas. The TLS was a huge success in Crosby with an increase of 145% in the number of households involved. The Red Alert group will grow the urban TLS through community engagement events and Red Alert membership. LWT was unable to secure the same level of participation in the other areas however possibly due to greater lack of interest from the communities than was estimated. LWT hosted a total of 64 events and training sessions between September 2016 and December 2019 engaging approximately 2,380 people. A full listing is contained in Annex C1.1. At the end December 2019, the LWT red squirrel project Facebook page had 1,798 followers (target 1,000) and achieved 13 media hits (target 36) (Annex C1.2). Media activity was hindered by negative publicity from animal rights protestors but LWT featured in high profile national television appearances on BBC Countryfile Diaries and BBC Homeground. All deliverable outputs were achieved (Annex C1.3, C1.4 and C1.5).

Any modifications and EASME correspondence - None for this action

Major problems and delays

Delays in securing match funding delayed the start of this action. There were also some delays to this work, caused by a gap in the red squirrel ranger post in 2017 following a change in staff.

Complementary actions outside LIFE

LWT participated in the Sangar Institute '25 Genomes for 25 Years' project supplying grey and red squirrel samples to be used for genome sequencing. LWT worked with a PhD student studying utilisation of the urban environment by red squirrels. This research is due to be completed in 2021 and one of the outputs will be an urban management plan for red squirrels.

Continuation of action after funding ends

LWT staff remain in post and LWT is a partner in a new funding proposal, Return of the Reds, led by NWT to NLHF to further develop grey squirrel management and red squirrel conservation across northern England. Through RSU, the Red Alert group established links with volunteers in North Wales, increasing the capacity for continued partnership working beyond project.

¹ Red squirrels were decimated by a squirrelpox virus outbreak in 2008 where almost 80% of the population was lost.

C2: Island recolonisation prevention (RSTW)

Foreseen start date: 11/2015

Actual start date: 09/2016

Foreseen end date: 12/2019

Actual end date: 12/2019

Description of activities and comparison with planned output

Following Milestone assessment and as reported at the 2018 Mission meeting and subsequent progress reports it was evident that eradication per the ER would not be achieved. Grey squirrels were absent from several woodlands and overall populations were suppressed but such absence was considered temporary given the volume of animals being culled. A grey squirrel genetic analysis was commissioned in 2019 to illuminate to what extent this failure was driven by squirrel immigration or a reproductive response to culling. Initial results illustrated genetic diversity among grey squirrels in North Wales (Annex C2.1)². RSTW implemented the ER contingency and developed a quantified assessment of resources necessary to undertake eradication from 90km² of Gwynedd (Annex C2.2). RSTW and UW produced the ER invasion pathway risk assessment (Annex C2.3) highlighting the main ways in which grey squirrels could be incidentally transported via sea traffic and contained protocols to minimise such incidents. A protocol was agreed with RSPCA and North Wales Police and followed when grey squirrels are accidentally trapped and transported within motor vehicles. The early warning system in Gwynedd was not fully established partially achieving the ER as eradication was unsuccessful. However, volunteers installed camera traps at key mainland and island habitats adjacent to the Menai Strait and undertook 621 camera monitoring sessions. An Island community-based EWRR network was established following the C2 deliverable ‘Reactive proactive plan...’ (Annex C2.4). A parallel public information campaign included publication of an e-book (Annex C2.5) on grey squirrel detection and disease characteristics in native reds. This led to the removal of two grey squirrels from Anglesey in 2017, discovery of several pathological infections (Annex C2.6) and the prevention of a mainland squirrelpox outbreak in 2017 from spreading to the island (Annex C2.7). No squirrelpox occurred in island red squirrel populations achieving the ER. RSTW engaged 23,058 people through 380 community & training events (Annex C2.8).

Any modifications and EASME correspondence

In 2016 EASME stated that RSTW should follow OJEU for grey squirrel control contracts. No suitable tenders were received and EASME agreed that contracts could be issued singly. As noted in the 2018 progress report, RSTW allocated £25k to undertake genetic analysis.

Major problems and delays

Delays in securing match funding and OJEU delayed C2 commencement. A prime opportunity to control grey squirrels in 2016 was lost as contractors were not in place until February 2017.

Complementary actions outside LIFE

Clocaenog Forest was funded through NLHF only although it formed part of the greater RSU Programme. RSTW established the CRST community group who will continue management activity to safeguard the small red squirrel population post RSU.

Continuation of action after funding ends

Development funding was secured in 2020 through NLHF to develop a new project safeguarding red squirrels and pine martens across north Wales.

² At the time of writing all universities and laboratories are closed due to Covid-19 and the subsequent UK lockdown. When they reopen, the final analysis will be completed.

Action C3: The prevention of the loss of the English mainland's only grey squirrel free woodlands (NWT)

Expected start date: 11/2015

Actual start date: 03/2016

Expected end date: 09/2019

Actual end date: 09/2019

Description of activities and comparison with planned output

NWT recruited two rangers and fieldwork began in July 2016 with a third ranger joining the team in September. By September 2016 the design of the early warning monitoring system was complete, and 51 sites were surveyed in October 2016 using trail cameras. 37% of these were carried out by new volunteers and this established the baseline for volunteer involvement. By July 2019, the final round of early warning system monitoring, 595 surveys had been completed and a figure of 96% volunteer delivery was achieved, surpassing the ER (75% volunteer delivery). No outbreaks of squirrelpox virus occurred in this area.

The central purpose of the early warning system was to detect grey squirrels as they arrived, providing critical intelligence to help achieve the ER successful protection of 350km² woodland from colonisation by grey squirrels. Additionally, the rangers and four volunteer groups worked to systematically remove grey squirrels within the defined zones. No grey squirrels were caught within a 3km zone of the main forests maintaining them as free from grey squirrel colonisation. All grey squirrel control data was provided to NU. All deliverable outputs for C3 were completed (Annex C3.1, C3.2 and C3.3).

Any modifications and EASME correspondence

Following 2017 staff resignations, NWT created a Data & Monitoring Officer post, ensuring greater support and management for data and delivery of the EWRR system. This was deemed acceptable by the NEEMO monitor in June 2017.

Major problems and delays

EWRR system monitoring proved successful in detecting red and grey squirrels. However, frequent detection of grey squirrels, in multiple locations around large, remote expanses of forest posed a significant challenge as resources were insufficient to be able to respond effectively to all sightings. NWT worked to resolve this by encouraging several volunteers to undertake grey squirrel control and providing financial support to two local red squirrel groups.

Complementary actions outside LIFE

Following recorded sightings of pine martens captured through the EWRR system, NWT worked with Forestry England in 2019 to devise a methodology designed to maximise detection of pine martens and squirrels. In 2018 NWT and SSRS signed a reciprocal data sharing agreement, and mapping outputs are now being produced to demonstrate cross border working and effort.

Continuation of action after funding ends

NWT worked closely with the main landowner Forestry England in the Kielder stronghold, and several key private estates. In October 2019 Forestry England agreed to support NWT-led vigilance. Contracts were also agreed with three local estates, providing additional funding through Countryside Stewardship Land Management Schemes. NWT is leading the development of a new funding application to NLHF in partnership with LWT and Cumbria Wildlife Trust to build on and develop the work of RSU across northern England called Return of the Reds.

C4: New eradication and control initiatives in Northern Ireland (UW)

Expected start date: 11/2015

Actual start date: 03/2016

Expected end date: 09/2019

Actual end date: 10/2019

Description of activities and comparison with planned output

Following least cost pathways assessment by NUI Galway and Queens University Belfast (Action A4), the Mourne Mountains area was selected as the grey squirrel eradication zone. The effort was largely successful achieving the ER and grey squirrels are now scarce in the zone. Parts of the eradication boundary line are porous and the community-led EWRR network will address any re-incursions and maintain the area as grey squirrel free. UW worked with 94 local landowners (exceeding target of 50), securing access for monitoring and grey squirrel control. Developing EWRR networks was also vital in Fermanagh which holds the largest population of red squirrels in NI. Grey squirrel numbers are currently very low but the area was vulnerable to incursion. UW established an EWRR system achieving the ER which will be maintained post project by the Donegal and Fermanagh red squirrel groups. Four grey squirrel sightings were reported in north east Fermanagh throughout the project, three of which were removed. 16 new members joined the seven existing squirrel groups (exceeding the target of eight) as a direct result of RSU recruitment from 2016. UW also facilitated the establishment of six new IAS groups (exceeding the target of three) including the first red squirrel group in the ROI – the Donegal Red Squirrel Group. UW achieved a total of 158 media hits in NI (exceeding target of 36) including 23 radio broadcasts, 10 TV broadcasts and 95 newspaper articles printed, as well as 23 online articles published (Annex C4.1). A total of 29 (exceeding target of 15) Lantra accredited grey squirrel courses in best practice grey squirrel management techniques were held, training 184 volunteers. Twenty two (target 42) training courses were delivered not meeting the target although other training targets were exceeded. UW hosted 207 community engagement events (exceeding target of 50) engaging 14,086 people (Annex C4.2). C4 deliverables Squirrel and Pine Marten Presence Absence surveys (Annex C4.3, C4.4 and C4.5) were delivered in all three years, with more than 200 woodlands surveyed. As part of the survey, UW delivered 18 survey workshops across NI. All grey squirrel control data was sent to NU.

Any modifications and EASME correspondence - N/A

Major problems and delays

Delays in securing match funding delayed start of this action.

Complementary actions outside LIFE

During 2019 (in addition to the presence absence survey) UW participated in the All-Ireland Squirrel and Pine Marten Survey with National Park and Wildlife Service, Vincent Wildlife Trust and NUI Galway. UW worked with an Msc student in 2018 assessing the efficacy of the Kania 2000 trap used in conjunction with a live capture trap (Annex C4.6). In 2019, red squirrels were downgraded to a species of ‘least concern’ from ‘near threatened’ as per the Irish Red List for Terrestrial Mammals³. Work undertaken through RSU undoubtedly contributed to this.

Continuation of action after funding ends

One UW Conservation Officer will remain in post for 12 months post RSU to continue support to community groups and participate in the development of an all-Ireland Red Squirrel Strategy.

³ Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland

D1 – Monitoring and evaluation framework (RSWT)

Foreseen start date: 11/2015

Actual start date: 08/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

RSWT developed a monitoring and evaluation framework (Annex D1.1) to track progress against objectives, expected results, indicators, milestones and deliverables. Progress against milestones and deliverables was then analysed and evaluated. Information was updated and reviewed regularly by RSWT and annual copies of the M&E framework submitted to EASME with the mid-term and progress reports. Information was provided by AB's to the CB via submission of quarterly monitoring reports, following PMB conference calls or meetings, or from ABs contacting the CB on an individual basis. The PMB received and shared regular reports and updates on RSU progress and made decisions on any corrective actions or otherwise. Partners discussed and attempted to rectify any slippages to project delivery, and if necessary requested formal changes to their delivery timescales.

Evaluation of conservation and research actions relied on the successful completion of various baseline reports in the preparatory actions. These were completed by various partners within the Partnership. The CB collated reports relating to all actions centrally. There were no deliverable outputs or milestones associated with this action.

Any modifications and EASME correspondence

N/A

Major problems and delays

N/A

Complementary actions outside LIFE

N/A

Continuation of action after funding ends

N/A

D2 – Socio-economic impact evaluation in local population and economy (FR)

Foreseen start date: 11/2015

Actual start date: 08/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

Following the baseline survey conducted under Action A5, FR social scientists visited project delivery areas to understand more clearly the objectives and activities of each project area. FR interviewed volunteers and key stakeholders including landowners from across the project areas which captured volunteer motivations and values, highlighted barriers to volunteering and how the volunteering experience could be improved.

FR gave presentations to the PMB in 2017, 2018 and 2019 and presented at all four Knowledge Fairs. Regular progress updates were provided through monthly PMB teleconferences. D2 deliverable annual reports were produced for 2017, 2018 and 2019 (Annex D2.1, D2.2 and D2.3). The A5 baseline survey was conducted on a UK wide basis but due to the difficulty of securing participants from RSU delivery areas, it was decided to conduct the final attitudinal survey in project delivery areas only with 1,000 participants utilising a more focussed approach. The final attitudinal survey was undertaken in the summer of 2019 and analysis illustrated that knowledge of the issues that red squirrels face and grey squirrels pose is greater in project areas than across the rest of the country. Full outcomes are documented in the D2 deliverable final socio evaluation report (Annex D2.4). FR also analysed volunteer experiences in red squirrel conservation providing insights from RSU volunteers (Annex D2.5).

Following confirmation by the LIFE NEEMO monitor that the ‘economic’ aspect must be addressed, the CB commissioned ERS to undertake a cost benefit analysis/evaluation that quantified and monetarised the total benefits generated through RSU. The analysis (Annex D2.6) considered a series of social, economic and ecological factors and concluded that RSU generated £11.5 million of total benefits throughout the lifetime of the project. All expected results, indicators, milestones and deliverable outputs were achieved for this action.

Any modifications and EASME correspondence

The cost benefit analysis was not included in the original budget. The CB reallocated budget for this and referenced it in the November 2019 progress report following discussion with the NEEMO monitor.

Major problems and delays

Delays securing match funding meant it would not have been cost-effective to visit project areas before RSU had been properly set up. FR undertook visits to project areas in the latter half of 2016 when project teams were established.

Complementary actions outside LIFE

FR worked on a Forestry Commission funded project looking at stakeholder attitudes towards pest management. In particular, how positive and negative assessments (‘attitudes’) of management methods can affect decision-making. They are also leading on research about landowner/public perceptions of risk and attitudes towards Oak Processionary Moth control.

Continuation of action after funding ends

The results and evaluation were turned into research papers for submission to peer reviewed journals as part of action E3.

D3 Ecosystem function restoration assessment (NU)

Foreseen start date: 10/2016

Actual start date: 11/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

NU developed bespoke modelling approaches to assess success of conservation actions for each project area achieving the ER. The models and description of the overall framework and data requirements are documented in the deliverable output annual reports (D3.2-4). To use statistical modelling approaches to robustly assess the ecological change requires high-quality data and a precise record of the implemented management in space and time, which proved demanding for AB's to provide. Adjustment of management in response to the modelling was therefore not deemed feasible, instead the analysis of **Rates of grey squirrel removal per unit control effort through time and space** was conducted at the scale of data collection. The relationship between control effort and control success was further investigated as part of the second objective aiming to **Assess the effect of management interventions on grey squirrel abundance/range**. The analysis highlighted challenges and provides guidance for the sampling design of future projects with similar ecological aims. Analysis for the third objective, **Assessing change in abundance and range of red native squirrel in response to RSU control operations**, was confounded by observer bias. Suitable data were not systematically collected across all sites preventing fine scale assessment of change. However, AB's recorded improvements in red squirrel abundance or distribution at a broad scale through additional monitoring surveys undertaken in some project areas. The fourth objective assessed the **Impact of management on the proportion of grey squirrels carrying infections** and showed asymptomatic disease prevalence (adenovirus and squirrelpox) across all four project areas was an established feature of each population (Annex D3.1). NU produced three deliverable output annual reports (Annex D3.2, D3.3 and D3.4), presented annually to the PMB and at knowledge fairs and provided regular updates at PMB conference calls achieving the ER. NU visited project areas to understand individual AB requirements throughout the project. The deliverable final ecosystem function restoration assessment (Annex D3.5) was produced summarising key findings and contained a series of recommendations for future IAS management projects which have been presented at international conferences (Action E3).

Any modifications and EASME correspondence

D3 was extended to March 2020 ensuring complete analysis of project results following EASME acceptance of the project prolongation.

Major problems and delays

Delays incurred due to securing match-funding delayed data collection by ABs and development of the models.

Complementary actions outside LIFE

NU students conducted research projects on modelling reintroduced squirrel spread, citizen science and the trap loan scheme. A visiting researcher from the University of Rome with previous experience from U-SaveReds (LIFE13 BIO/IT/00204) joined the NU team and conducted modelling to inform early warning systems.

Continuation of action after funding ends

NU will continue to feed RSU recommendations and outcomes from RSU to other IAS management projects through academic networks in the UK and internationally.

E1 Annual Knowledge Fair (RSWT)

Foreseen start date: 01/2016

Actual start date: 11/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

Four Knowledge Fairs were held over the lifetime of the achieving the ER. Initially, Knowledge Fairs were scheduled for September every year but due to the delays in starting the project, the first Knowledge Fair was moved to March 2017 with the final Knowledge Fair held in February 2020. Knowledge Fairs moved around the project areas and were held in Belfast, Bangor, Southport and Newcastle upon Tyne respectively. Each Fair was a two-day residential event and following feedback received following the first Fair, these were held over a weekend to enable full community participation. Planning for the Knowledge Fairs was led by the CB with inputs from AB's and inputs were also sought from delegates ahead of each Fair. The CB and AB's all presented and led interactive workshops across the Fairs and each Fair included an excursion to an RSU project site. The exception to this was the final Knowledge Fair held in Newcastle where a suitable RSU project site was not available due to logistics (distance, accessibility, size etc) and the excursion was held at Gosforth Nature Reserve where delegates learned about holistic reserve management. Fairs focussed on red and grey squirrels and associated issues and provided an opportunity for community groups to showcase their own work. The final Knowledge Fair broadened the agenda to include IAS management projects across the UK and Europe and facilitated best practice sharing, methodology and lesson learning across the broader sector. Several LIFE funded projects presented at Fairs including U-SaveReds, LIFE Laserfence, The Nordic Raccoon Dog Project and the Orkney Native WildLIFE project. In total 440 attendees (target 480) attended the Knowledge Fairs representing community groups, conservationists, academics, researchers and government departments. Although the target was not met, delegate numbers increased at every Fair demonstrating their popularity. All outputs from the Fairs are displayed on the [RSU website](#) and contained in Annex E1 achieving the ER. The final Knowledge Fair in Newcastle was filmed, and 14 videos were produced contributing to Action E2 deliverable best practice videos. The Knowledge Fairs represented a unique opportunity to draw together every aspect of the sector in the UK and received very positive feedback. As the Fairs covered the full cost of the event and provided a small travel bursary to volunteers it removed many of the barriers to inclusion and made the fairs as accessible as possible.

Any modifications and EASME correspondence

Delivery of the final Knowledge Fair was moved to February 2020 following EASME acceptance of the three month project prolongation request. This allowed Fairs to be held annually rather than hosting two Fairs in 2019.

Major problems and delays

The delay in securing match funding delayed the start of this action.

Complementary actions outside LIFE

N/A

Continuation of action after funding ends

The Knowledge Fairs are unable to continue at a national scale. However, if funding is successfully secured through the proposed Return of the Reds project led by NWT, annual Knowledge Fairs will return on a smaller scale.

Action E2 Layman's communication resource production and dissemination RSWT

Foreseen start date: 03/2016

Actual start date: 11/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

Twenty noticeboards were produced and distributed to partners for display across project sites in 2017. The [RSU website](#) was established in 2016 and contains all the resources produced by RSU including blogs, latest news, Knowledge Fair outputs, publications, webinars and videos. The RSU Twitter feed, had 1,491 followers by the end of March 2020 and 1,467 Facebook followers exceeding the ER of 1,300 for both channels. The ER of four annual education plans was not achieved although an education plan was produced for 2019 (Annex E2.1). Three deliverable output best practice guides were published (Annex E2.2) in 2019 and 2020 achieving the target. Following an ERG conducted in 2016, the grey squirrel management guide was co-authored with the FC constituting new national best practice. A total of nine deliverable RSU e-newsletters (Annex E2.3) were produced achieving the target. The target of 10,000 subscribers was not achieved and the total number of subscribers was 243. Sixteen articles (Annex E2.4) were published in membership magazines over the lifetime of the project exceeding the target of 10. From 2018, 12 blogs were also posted on the RSU website (Annex E2.5) giving insights into different aspects of red squirrel conservation and the project.

A total of 29 deliverable best practice videos were produced (Annex E2.6) exceeding the target of ten. These were a mix of videos aimed at practitioners and shorter videos aimed at the general public. RSU also hosted nine evening webinars throughout 2019 which successfully engaged the broader IAS community and utilised speakers from across the project and the wider IAS sector (Annex E2.7). All webinars were recorded and displayed on the RSU website enabling continued access. Three annual (2016, 2017, 2018) deliverable Layman's reports were published along with the final full project Layman's published in 2020 (Annex E2.8). The 2016-2018 Layman's reports were produced electronically with the final Layman's report printed and distributed at the final Knowledge Fair. All Layman's reports and best practice guides (excepting the grey squirrel management guide) were translated into the Welsh language and made available on the RSU website. RSU was represented in 171 TV/radio broadcasts, print and online media articles (Annex E2.9) throughout the lifetime of the project. Twenty three press releases (Annex E2.10) were released by the CB and AB's achieving the target of 20.

Any modifications and EASME correspondence

N/A

Major problems and delays

The delay in securing match funding delayed the start of this action. Considerable time and resource were diverted in 2017 dealing with negative publicity following an article in The Guardian. Further information on this is provided in [section 5.2](#).

Complementary actions outside LIFE

RSU participated in activities during Red Squirrels Awareness Week and Red Squirrel Appreciation day throughout the project.

Continuation of action after funding ends

The RSU website will remain live for five years post project. The CB and AB's will continue to promote and disseminate RSU resources outputs.

E3 – Dissemination for IAS policy makers and scientists (NU and FR)

Foreseen start date: 03/2016

Actual start date: 11/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

The delays in project commencement (due to match funding) impacted upon research outputs meaning the ER of four papers published in academic journals was not achieved. The journal submission and revision process is very time consuming and lengthy and Action E3 simply ran out of time to get these published prior to project end. However, two deliverable papers were published in the Biological Conservation Journal in March 2019 (Annex E3.1) and one in the Mammal Review Journal in March 2020 (Annex E3.2). Further papers continue to be submitted and will be published following project end. A draft copy of a planned submission to the Biological Conservation Journal is contained in Annex E3.3.

FR and NU also hosted an ERG (not funded by LIFE but part of wider RSU project) in November 2019 focussing on the social dimensions of invasive species and different management options. Outputs from this will be submitted for journal publication post project. An abstract was submitted to the British Ecological Society (BES) spring 2020 conference (2-3 March) and accepted as a poster presentation (Annex E3.4).

Six academic conferences were attended throughout the project lifetime exceeding the ER of two. FR attended IUFRO in Freiburg (2017) (Annex E3.5), IUFRO in Brazil (2019) (Annex E3.6) and BES Spring 2020 where they presented on RSU social attitudes outputs. NU attended NEOBIOTA in Dun Laoghaire (2018) (Annex E3.7) and BES Winter 2019 (Annex E3.8) where poster presentations were given on grey squirrel control outputs from RSU. NU and FR also co-hosted an interactive session at the Mammal Society Autumn Symposium (November 2018) which focussed on invasive species where presentations were given by the CB and other IAS projects prior to a panel discussion. Outputs from this session formed the basis of the paper published in the Mammal Review Journal as noted above.

Any modifications and EASME correspondence

As IUFRO 2019 was in Brazil and therefore outside the EU, advice was sought from the NEEMO monitor as to whether attendance would be permissible. Given the added value to RSU as project outputs were being presented, the NEEMO monitor deemed this acceptable.

Major problems and delays

Delays to the start of the project meant data collection did not begin until staff were in post. This meant the research element ran approximately six months behind schedule and although some of this time was recovered NU and FR were unable to publish four journal papers in the project timescale. However, although four journal papers were not published directly under Action E4, the CB and AB's co-authored several published journal papers directly relating to RSU outputs and these are documented under the relevant actions (C2 and E4).

Complementary actions outside LIFE

N/A

Continuation of action after funding ends

Journal papers will continue to be submitted based on RSU outputs post project by NU and FR. These will feed into longer term management strategies for IAS.

E4 – networking with other LIFE and/or non-LIFE projects (RSTW)

Foreseen start date: 03/2016

Actual start date: 11/2016

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

Throughout the lifetime of the project, RSU liaised with 17 LIFE funded projects and 18 non-LIFE projects significantly exceeding the ER's of five and five respectively. Interactions included attending and/or presenting at conferences, sharing best practice and lesson learning, co-authoring academic journal papers and direct project to project engagement. Many interactions resulted in strong outputs for RSU. A full listing of projects liaised with, and the nature of interaction is contained in Annex E4.1. Those of particular note are reflected here.

Following a discussion with the NEEMO monitor in February 2018, RSTW engaged with LIFE LaserFence who trialled a laser device to evaluate its efficacy as a grey squirrel deterrent. Unfortunately, this was not successful but there is future potential for this methodology in grey squirrel management. LWT conducted an exchange visit with the Orkney Native WildLIFE project in June 2019 sharing lesson learning on using detection dogs for conservation. The CB and RSTW attended the LIFE Artemis conference on forest IAS in 2019 where the RSU presentation (Annex E4.2) was selected to be developed into an academic journal paper (Annex E4.3). RSU also co-authored two additional journal papers generated from the conference (Annex E4.4 and E4.5). These are in press at the time of writing (March 2020). Five LIFE projects, one Interreg project and two non-LIFE projects contributed case studies to the IAS Colonisation Prevention best practice guide (Action E2 deliverable) resulting in a stronger output.

SSRS presented at the Knowledge Fair in 2017 and 2019 (Action E1 deliverable), hosted a webinar for RSU on optimising the use of social media in June 2019 and adopted the approach pioneered by AB UW for using a Kania 2000 trap in conjunction with a live capture trap. RSU, UKSA and SSRS also co-developed a 'questions and answers' reference paper (Annex E4.6) that could be used across the sector to respond to queries demonstrating collaboration, unity and consistent messaging. The CB and several AB's attended a Red Squirrel Strategy Workshop hosted by UKSA and Defra in September 2019 providing inputs to the development of an England strategy for red squirrel conservation (not yet published). Supporting presentations for all events RSU presented at are captured in Annex E4.7.

Any modifications and EASME correspondence

None for this action

Major problems and delays

N/A

Complementary actions outside LIFE

RSTW liaised with the Roseate Tern (LIFE14 NAT/UK/000394) regarding risk management and pine martens ahead of the captive bred pine marten release project commencing later in 2020. Note, release of the pine martens has been delayed due to Covid-19 and the subsequent UK lockdown.

Continuation of action after funding ends

AB's will continue to liaise and collaborate with LIFE and non-LIFE projects post RSU.

F1 – Project Management by The Royal Society of Wildlife Trusts (RSWT)

Foreseen start date: 11/2015

Actual start date: 11/2015

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

During the preparatory action phase and whilst waiting for confirmation of match funding, RSWT's management staff took forward all project management and partnership liaison. Following recruitment, the project secretariat team was in place by August 2016. There were several CB staff changes throughout the project most notably to the programme manager role following two resignations in July 2017 and February 2018. The third programme manager remained in post to the end of the project. The first finance officer also resigned in January 2017 with the second finance officer remaining in post to the end of the project. The CB visited all partner areas throughout the project which built relationships, increased CB familiarisation with the different project areas and enabled AB discussions to focus on their specific requirements.

The PMB was established at the beginning of the project and met for the first time in January 2016. Overall the PMB met face-to-face 11 times and undertook 19 monthly teleconferencing calls (Annex F1.1) exceeding the ER of eight. The PAG was constituted in 2017 and held its first face-to-face meeting in August 2017. The PAG met twice per year thereafter with one further face to face meeting in December 2018 and four teleconference calls (Annex F1.2) throughout the project. Due to the delay in commencing this action and the subsequent delay in constituting the PAG, the ER of eight meetings was not achieved. PAG membership was constituted from AB's and external representation from organisations including the Welsh Government, Northern Ireland Environment Agency (NIEA) and the UKSA. The PAG added significant value to RSU through additional expertise, strategic advice and guidance. All progress reports and payment requests were submitted on time to EASME with the exception of the Mid-term report where an extension request was requested and granted.

Any modifications and EASME correspondence

As 100% of the pre-financing payment had not been spent, a request to extend the deadline from July 2017 to February 2018 for submission of the mid-term report was submitted to EASME and granted. Delays in securing match funding meant the project ran approximately six months behind schedule. Although much of this time was recovered, it became apparent that some additional time was needed to fully achieve outputs and RSU submitted a three-month project prolongation request to EASME which was granted in October 2019 extending the project to 31 March 2020.

Major problems and delays

Delays in securing match funding and difficulties with recruiting delayed the start of this action.

Complementary actions outside LIFE

Two RSU Partnership Review Workshops were also held in September 2018 and June 2019 providing an opportunity to reflect on, and evaluate partnership working (Annex F1.3). These were not funded by LIFE but formed part of the greater RSU project.

Continuation of action after funding ends

RSWT will maintain the RSU website for five years post project and continue to disseminate RSU outputs.

F2 Audit (RSWT)

Foreseen start date: 11/2015

Actual start date: N/A

Foreseen end date: 12/2019

Actual end date: N/A

Description of activities and comparison against planned output

Following communication from EASME in 2018 regarding the amendment to the audit threshold, this action was no longer applicable to the project.

F3 Indicators (RSWT)

Foreseen start date: 11/2015

Actual start date: 11/2015

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

Tables of project deliverables, milestone and indicators were managed by the CB (Annex F3). The project specific indicators were updated annually. Final indicator tables were completed at the end of the project for submission with the final LIFE report. This action was delayed by three months due to the project extension granted by EASME.

F4 AfterLIFE plan (RSWT)

Foreseen start date: 11/2015

Actual start date: 11/2015

Foreseen end date: 12/2019

Actual end date: 03/2020

Description of activities and comparison against planned output

Discussions regarding post project legacy took place throughout the project with the PMB and the PAG about the project legacy and future funding. Inputs were also sought at Knowledge Fairs which informed the final deliverable output AfterLIFE Plan (Annex F4). Initially the intention was to produce a public facing AfterLIFE plan to be launched at the final Knowledge Fair. However, following an amendment to LIFE guidance to only submit the AfterLIFE Plan as a separate chapter to the final report to LIFE, the project decided to produce one printed document combining the final Layman's report with a public facing AfterLIFE section (Action E2 deliverable). This was discussed with the NEEMO Monitor who deemed this approach acceptable. Five hundred copies of this report were printed and distributed at the final Knowledge Fair in February 2020. Printed copies were also provided to AB's to distribute at community events.

Any modifications and EASME correspondence

N/A

Major problems and delays

N/A

Complementary actions outside LIFE

N/A

Continuation of action after funding ends

The AfterLIFE plan documents post project activity.

5.2. Main deviations, problems and corrective actions implemented

The biggest challenge for the project was the delay incurred at the beginning of the project due to the delay in securing match funding. This was confirmed in May 2016 but the knock-on effect delayed staff recruitment and commencement of delivery actions by approximately six months. RSU worked hard to recover this time and address slippages and with a three-month project prolongation request granted by EASME, successfully delivered project objectives and outcomes.

Several staff changes occurred throughout the project lifetime most notably with the RSU programme manager. Following the second resignation, a third programme manager was immediately appointed from within RSWT to minimise disruption to the project. There was a three-month gap in the Action C1 ranger post between May and July 2017, which impacted on grey squirrel control and coincided with an increase in grey squirrel numbers after a successful breeding season. This situation was then exacerbated by a spate of sick and dead red squirrels reported throughout the summer of 2018 and into 2019 which redirected resources. LWT aimed to employ a contractor to help with grey squirrel control but had difficulty filling the position. Efforts were then focused on recruiting volunteers to assist with and maintain grey squirrel control in the priority woodlands which was more successful.

Unfortunately, late Action C2 commencement missed a 2016 spring/summer window which followed poor autumn 2015 seed crops and thus was a period when animals were highly trappable. Autumn 2016 had good seed crops which retarded trapping efficiency into 2017. Recruiting both contractors and volunteers to undertake grey squirrel control proved more challenging than expected. Having followed the OJEU tender process, RSTW sought guidance from EASME and were able to contract 'natural persons' to fulfil the professional trapping requirements. However, these delays undoubtedly contributed to the failure to achieve eradication in the C2 area. RSTW then quantified the resources necessary (C2 ER) to eradicate grey squirrels from a 90km² area and explored the potential for using captive bred pine martens as a biological suppressant.

Following recommendation from the Action A4 baseline which suggested it would be beneficial to expand the project area covered by UW, four areas were proposed for C4 delivery. UW modified the location of two rangers on this basis and split the two-full time community engagement posts into three part time positions to cover this extra range. This was deemed acceptable by the NEEMO monitor.

In February 2017 RSU attracted significant negative publicity from animal rights groups following an inflammatory and incorrect headline which appeared on The Guardian online. This was followed up by two petitions calling for an end to mass culling of grey squirrels across the UK (not an aim of the project). The headline was later retracted as inaccurate but significant time and resource was diverted to address this. Following this and ongoing low-level issues with animal rights activists position statements were created (and formed the basis of the collaboratively created Q&A's under E4) and used to respond to queries where necessary. A group of local animal rights protestors also targeted LWT and in particular the grey squirrel management activities which created negative publicity around the project. This impacted on LWT ability to build community capacity, particularly in Southport and Maghull as protestors demonstrated at several events. Some events were cancelled or relocated and by continuing to promote positive aspects of the project the attention the project received from animal rights activists greatly reduced.

5.3. Evaluation of Project Implementation

Overall RSU was highly successful drawing together conservationists, community groups, government bodies, academics and research from across the UK and Europe. It achieved all its objectives suppressing grey squirrel populations across all project areas and stabilising or increasing red squirrel populations. The delay in securing match funding at the beginning of the project delayed commencement of delivery actions and a three month project prolongation was successfully requested moving the project end date to 31 March 2020. RSU cost effectiveness and value for money is well documented in the CBA conducted by ERS under Action D2.

EWRR networks were established across all project areas with the aim of becoming community led and self-sustaining by the end of the project. This was successful although it was noted that a degree of staff support is required on an ongoing basis to provide support to community groups and ensure momentum and motivation is not lost. Rapid response mechanisms were challenging in the Kielder forest area where NWT rangers struggled to respond rapidly to all reports of grey squirrel incursion due to time, distances involved and resource available. Several volunteers were trained in grey squirrel dispatch to aid this but additional ranger resource (beyond the two employed) would have been beneficial in this vast, remote area. EWRR networks in Merseyside, Anglesey and NI worked well and will be sustained by community groups and volunteers post project with small amounts of staff support. RSU worked at a landscape scale level undertaking grey squirrel control through live capture trapping and/or shooting following UK best practice guidance. Working as a partnership enabled usage of innovative methodology such as the Kania 2000 trap with a live capture trap, detection dogs and non-invasive infection detection methodology to filter across project areas. Real time analysis and feedback to inform grey squirrel control as part of the NU modelling proved challenging. The template was complex and time consuming to complete and in hindsight use of a mobile application that could have recorded and sent data direct to NU may have been preferable. However, this was the first time that modelling of this nature was tried on this landscape scale and important lessons were learnt. Recommendations taken from lessons learnt were developed for future IAS management projects benefitting the broader IAS community.

RSU successfully shared lessons with the broader IAS community through collaboration with other LIFE and non-LIFE funded IAS projects. The annual Knowledge Fairs were highly successful representing a unique opportunity to bring together a broad range of IAS community stakeholders across the UK and Europe. Dissemination and outreach activities were achieved with many appearances in the regional and national media and high levels of community engagement. However, due to negative publicity and targeted campaigns by animal rights protestors around grey squirrel control, national media was not capitalised on as much as it could have been.

RSU directly underpinned the EU regulation (1143/2014) on IAS, the Wildlife and Countryside Act (1981) and contributed to the development of the UK IAS (Enforcement and Permitting) Order which came into force on 1 December 2019. However, a key flaw was identified in the Forestry Act 1967 following incidences of tree felling in red squirrel woodlands during the breeding season. The Welsh Government committed to reviewing the legislation, but Defra has stated that they have no plans to review the Act and do not see an issue with it. National best practice guidance (FCN4) on grey squirrel control was updated and co-authored by RSU partners. This was published in December 2019 and constitutes new government national best practice guidance. RSU also contributed to the development of an England red squirrel strategy being developed by Defra and the UKSA. At the time of writing this had not yet been published.

5.4. Analysis of benefits

5.4.1 Direct/quantitative environmental benefits

The EU Regulation (1143/2014) on invasive alien (non-native) species lists the grey squirrel as a species to be managed by controlling/eradicating established populations, prevention of spread and detection of incursion to prevent establishment phase and re-colonisation. RSU directly supported this legislation by working across four areas of the UK where grey squirrels are present, covering 49,222 m² of land. Grey squirrel populations were suppressed across all project areas enabling stability and increase in some project areas of red squirrel range and distribution. Anglesey sustained the largest and most genetically diverse native red squirrel population in Wales and Action A2 complementary action assessing viral infection using hair samples has transferability for non-invasive infection monitoring in EPS including bats and dormice. This also benefits populations in Natura 2000 sites with the development of suitable genetic PCR tests. The CBA conducted by ERS highlighted that RSU created an estimated £283,000 of ecological benefits arising from potential savings to the UK timber sector as a result of reduced bark stripping by grey squirrels, supporting 10 FTE jobs. ERS also found an estimated red squirrel existence value of £3.2 million across RSU project areas following Willingness to Pay analysis.

5.4.2 Qualitative environmental benefits

Reductions in bark stripping by grey squirrels not only carries a commercial gain but demonstrates ecological benefits through carbon sequestration and protection of UK native hardwoods which benefits future ancient woodlands. Self-sustaining early warning and rapid response networks were established across all project areas. This led to elevated levels of public awareness and dynamic community participation in invasive species detection reducing the probability of grey squirrel incursion or reinvasion. Establishment of new volunteer groups, increased membership of existing groups and upskilling has strengthened the community effort and built capacity to conserve red squirrel and control grey squirrels post project. Communities have been empowered with knowledge on red and grey squirrel ecology and there are increased levels of public awareness on issues arising from IAS particularly in project areas. The Welsh Government committed to reviewing the outdated Forestry Act 1967 so that felling licences can be refused or issued with enforceable licence conditions, to better protect habitat of protected species following a campaign led by RSTW and supported by RSU partners.

5.4.3 Economic benefits

RSU directed supported 19 FTE posts. The PDRA at NU was a qualified post with the remaining 18 posts covering ranger, community engagement and project management roles. Fifteen FTE remained in post at the end of the project and several staff no longer in post have continued as volunteers. The CBA conducted by ERS demonstrated that RSU generated total benefits estimated at £11.5 million over the lifetime of the project supporting 175.5 FTE based on social, economic and ecological factors. An estimated 189,000 visitors within RSU areas were attributed to presence of red squirrels and project activity generated £10.3 million in additional visitor spending, directly supporting 165.5 FTE jobs. Volunteers contributed more than 44,000 hours to the project with an equivalent value of £865,000 and RSU generated an estimated £283,000 of ecological benefits arising from potential savings to the UK timber sector, supporting 10 FTE jobs.

Overall this resulted in a benefit cost ratio of 4.53:1 translating to £4.53 of benefits for every £1 of public investment. Set against an overall project budget of circa £3 million, this demonstrates the excellent value for money represented by RSU.

5.4.4 Social benefits

Elements of RSU relied on volunteers. Research conducted by Essex University⁴ in 2017 involving The Wildlife Trusts showed that nature volunteering, especially where there is contact with green space, improves levels of mental wellbeing. This was substantiated by research conducted by FR throughout the project and findings from the CBA which highlighted positive impacts on volunteer wellbeing including improvements in mental health, keeping fit and active, the opportunity to socialise and meet likeminded people and an increased connection with the natural environment. For younger volunteers, the opportunity to develop knowledge and skills contributing to their professional development and increasing their chances of sourcing employment in the sector was also important. Research conducted by FR and the CBA also highlighted the significant intrinsic cultural value that red squirrels represent for many people. This has also motivated decisions made by some tourists of where to go and what activities to undertake contributing an economic benefit to project areas too.

5.4.5 Replicability, transferability, cooperation

The excellent value for money RSU represented through a landscape scale partnership approach amplifying outcomes and impacts lends itself well to replicability and transferability across the IAS sector. RSU partners are building on methodologies and approaches developed through RSU into post project activities as documented in the AfterLIFE plan. Cost effectiveness of ongoing control is an issue for invasive species management across all species and countries. Live capture trapping was the predominant control method for RSU and indeed for other UK IAS projects but there is very little guidance on how to best conduct live capture campaigns to achieve eradication or long-term control. For many widespread mammalian IAS, control is often undertaken to limit impact in local landscapes with no landscape scale strategy in place. Through RSU's landscape scale approach, NU mapped and quantified the resources for the different approaches taken by project areas and developed a framework for modelling the impact of control operations on IAS population abundance. The framework and recommendations developed by NU can be used to inform future IAS management projects supporting determination and feasibility of achieving control targets or ongoing management objectives. Approaches and methodologies applied by RSU and other European mammalian IAS projects are well documented in the IAS Colonisation Prevention Best Practice guide (Action E2) and these along with the methodologies described in the best practice videos and webinars can be replicated by other IAS projects. Peer reviewed journal papers also demonstrated cooperation and potential for replicability such as Shuttleworth et al. *Evolving grey squirrel management techniques in Europe* LIFE Artemis (Action E4) which documented RSU methods of detection and rapid response. Community support generated through RSU demonstrates strong potential replicability for lethal control of mammalian IAS.

UW developed a Lantra accredited grey squirrel course in best practice grey squirrel management techniques which could be rolled out across the UK. The uptake and the subsequent application of techniques taught during the courses was greatly assisted by the adoption of the Kania 2000 trap for dispatch of grey squirrels caught in a live capture trap. Usage in this manner is not deemed by UK jurisdictions to contravene Spring Trap Approval Trapping Orders and there is potential to further promote the use of this method of dispatch.

⁴ https://www.wildlifetrusts.org/sites/default/files/2018-05/r3_the_health_and_wellbeing_impacts_of_volunteering_with_the_wildlife_trusts_-_university_of_essex_report_3_0.pdf

5.4.6 Best practice measures

RSU was an exemplar of a multi-disciplinary, landscape scale, collaborative partnership demonstrating how effective knowledge sharing and lesson learning co-created best practice approaches throughout the project. RSU was the first grey squirrel management project to draw together initiatives from across the UK operating at a strategic, landscape scale level. Key elements of RSU lesson learning and best practice are documented below.

- **Strong community support for proactive invasive mammal detection and removal is essential.** RSU partners understood local opinion and were therefore able to galvanise support for grey squirrel control in rural, suburban and City areas with a bottom up and inclusive approach
- **Projects need to empower volunteers with skills, equipment and protocols.** To create a self sustaining legacy, this was essential and RSU provided many training and learning opportunities as well as equipment. Paid staff support is required to support and maximise the impact of local groups although the degree that this is required was variable
- **Established self-sustaining local volunteer groups.** This provided a strong post project legacy increasing the community effort to support red squirrel conservation and manage grey squirrel populations. Some level of staff support will also be maintained post project
- **Bespoke local management approaches to invasive species facilitated regional variation.** Approaches to IAS management must be multi-faceted and adaptive to be successful assessing landscape variability, purpose of control effort and community participation. This maximised RSU efficiency and impact and fertilised cross partner learning and adaptive management practice
- **RSU successfully shared lessons with EU & other international projects.** Participation and contribution to IAS management frameworks was key and RSU was able to share its own experience and expertise and learn from others too

RSU followed existing national best practice for grey squirrel management. The FCPN4 2007 note was revised by the FC and AB's and published in January 2020 constituting new national best practice guidance. RSU also published best practice guides, videos and webinars to empower IAS practitioners and community groups with increased knowledge for IAS management.

5.4.7 Innovation and demonstration value

RSU was the first project to draw together squirrel IAS communities across the UK, operating at a landscape scale. Working as a collaborative partnership allowed greater amplification and impact of project actions ensuring RSU added up to far more than the sum of its parts. RSU facilitated strong cross sector connectivity locally and internationally enabling greater knowledge sharing, lesson learning and best practice. LIFE funding not only enabled RSU to take place but connections brokered through LIFE facilitated much greater interaction with the European IAS community as demonstrated through Action E2 and E4. This was particularly highlighted through collaboration with the LIFE Artemis project which not only resulted in three journal papers (in review) co-authored by RSU partners but presented an opportunity for RSU to share its experience and expertise on IAS management. This was particularly relevant as Slovenia is at risk of grey squirrel incursion from neighbouring Italy.

Action A2 & C2 applied conservation best practice is now underpinning management of grey squirrels in western Canada. Action A2 also allowed a standardised approach to grey squirrel tissue sampling which otherwise would have remained variable across the UK. Following

collaboration between RSTW and APHA, a new non-invasive infection detection method using hair was developed and trialled with RSU partners. Along with lip and spleen tissue, this was used to detect the prevalence of squirrelpox and adenovirus in culled grey squirrels. This is a ground-breaking approach for the IAS sector as hair samples can easily be collected remotely aiding viral surveillance for red and grey squirrels. Results can then be assessed to determine infection presence and inform how resources are deployed across a management area to minimize the risk of infection spread.

The use of detection dogs in conservation is becoming more popular. LWT has the first fully trained red squirrel detection dog in the UK and this approach has also been adopted by UW. LWT also visited the Orkney Native WildLIFE project to share lessons from this approach. UW pioneered the use of the Kania 2000 spring trap in conjunction with a live capture trap and found that this method of dispatch increased the number of volunteers willing to undertake grey squirrel control. Following communication with the relevant UK agencies who deemed usage of the Kania 2000 in this manner not to breach Spring Trap Approval legislation, RSU partners and the SSRS project also explored using a Kania 2000 in this manner.

5.4.8 Policy implications

RSU submitted responses (Annex 5.1 and 5.2) to two government consultations throughout the project and maintained strong links with several government agencies. The first consultation focussed on the impact and management of non-native species convened by the Environmental Audit Committee. The second was hosted by Defra on Management Measures for widely spread IAS in England and Wales. Both RSU responses highlighted relevant approaches and methodology regarding grey squirrel management directly underpinning the EU regulation (1143/2014) on IAS and the UK IAS (Enforcement and Permitting) Order which came into force in December 2019. Following several notifications forest harvesting operations taking place in red squirrel areas during the breeding season, the CB and AB's supported RSTW's call for amendments to the 1967 Forestry Act. Currently tree felling licences cannot be refused or have conditions added on the grounds of flora and fauna which threatens red squirrels and other woodland dwelling EPS. The Welsh Government made a firm commitment to amend or redraft forestry legislation, but Defra has stated that they have no plans to review the act and do not see an issue with it. RSU provided a briefing (Annex 5.3) to a Conservative MP who convened a parliamentary debate on potential red squirrel extinction in the UK on 3 July 2019. The debate was well attended by cross party MP's and there was strong support for the 'asks' contained in the RSU briefing with mentions of RSU, the CB and AB's throughout and solidarity among MP's that these needed to be addressed. RSU planned to capitalise on this through further political engagement but unfortunately a period of political turbulence followed with changes to the UK Prime Minister and cabinet, uncertainty over Brexit, purdah and a general election. This combined with the Covid-19 outbreak unfortunately meant that all political traction was lost and there was no time prior to project end to re-establish political links. Following an ERG convened by FR in 2017, it was agreed that the 2007 FC Practice Note 4: Controlling Grey Squirrel Damage to Woodlands needed revision. The revised note was co-authored by FC and AB's (E2 deliverable) and published in January 2020 constituting new national guidance.

In September 2019 the CB and several AB's attended an England Red Squirrel Strategy meeting convened by Defra and the UKSA. This followed a questionnaire co-developed by RSU and UKSA which was circulated to stakeholders seeking their initial inputs on what the strategy should include. Outputs from the questionnaire and meeting will form a draft strategy. At the time of writing, this had not yet been circulated.

6. **Key Project-level Indicators**

The table of project specific indicators is contained in Annex F3. At the time of writing and as documented in the covering letter, we were unable to update the KPI's on the online KPI database as we were unable to access this. Several emails have been sent to the helpdesk at EASME and when access is rectified, the KPI's will be updated.