

1. Contestant profile

▪ Contestant name:	Colin Slator
▪ Contestant occupation:	Chair of HBNR
▪ University / Organisation	High Batts Nature Reserve
▪ Number of people in your team:	7 plus 35 volunteers

2. Project overview

Title:	In at the Start
Contest: (Research/Community)	Community
Quarry name:	Ure Valley

Abstract (max 0.5 page)

The project has created the foundation for long term community involvement in the new Pennycroft quarrying extension. The aim has been to create a partnership between the quarrying company and the wider community, working together to enhance the biodiversity value of the site as it evolves, and offering people the opportunity for learning and skills development through volunteering. The methodology included:-

- A public information campaign and events, highlighting opportunities to get involved;
- Recruitment and training of volunteer teams to undertake a programme of species monitoring using accredited methodologies;
- Design and creation of a monitoring route with numbered distance markers plus designated survey quadrats, and the building of a mobile hide for use on site;
- A programme of photographic recording using fixed points and drone surveys;
- Development of an educational and training base for volunteers and school classes;
- Work with local schools and the creation of an after school club.

The project was run by a team of 7 volunteers with a further 35 volunteers involved in specific project tasks contributing over 2000 volunteer hours. Fifteen organisations are involved in the project including two local schools. Organisations provided advice or training, donated services, or gave financial support. Two organisations provided additional volunteers for specific tasks, some gave publicity or practical support to the project, whilst others acted as consultees and sounding boards for our ideas.

The project achieved its objectives having created:-

- The physical infrastructure and the processes for a long-term programme of species and photographic recording during quarrying and restoration;
- A body of trained volunteers to undertake monitoring and habitat creation work;
- Enhanced interest in environmental activities by local schools and the potential for continuing and extending involvement in the site;
- New links with local community and environmental bodies;
- The foundation of an ecological data bank which can feed into the site restoration and management plans.

The project has provided benefits to all those taking part, and to the quarrying company, and has set the foundation for real biodiversity gain on site. Full realisation of the benefits will come with continuation and development of the activities on site over the longer term, and the potential for the site to link to the wider vision for the Ure Valley. The experience from the project, and the associated research work now being developed have applicability at other locations and can be used in relation to decision making on the management of sites before, during and after extraction.

Final report (max 9 pages)

Introduction & project aims

In August 2017 Planning Permission was granted to Hanson at its Ure Valley Quarry for an extension of quarrying onto an area known as Pennycroft, 32 hectares of arable farming land to the south of High Batts Nature Reserve. This meant that the Reserve would be for some time completely surrounded by quarrying activities, with the quarry plant and offices to the north, the Bellflask restoration processes going on to the east, and the new haul road running to the west. High Batts and Hansons were in discussion for many years about the impact of this extension on the ecology and activities of the Reserve and during those discussions, we touched on a possible involvement by Reserve volunteers in helping to monitor the site and assist with habitat creation and management. From this grew the “In at the Start” project comprising a partnership between Hanson, High Batts Reserve and the wider community to work together to maximise the opportunities (and reduce any negatives) which the new development presented.

We thought this was a unique opportunity, as we did not know of any other quarry development which had included this kind of company/community partnership right from the start of the quarrying process. We saw this as a long term partnership with the following objectives:-

- a) To build understanding from the local community of the quarrying operation so its significance and benefits are appreciated;
- b) To use the quarrying development for a programme of learning opportunities;
- c) To collect relevant environmental data that would feed into the Habitat Management Plan, create a historic record and be used by Hanson as base data for future developments;
- d) To build greater involvement by children and younger people in their local environment and in biodiversity enhancement;
- e) To build appreciation of the work involved in the restoration of the site so that the finished habitats and facilities are valued and cared for by the local community.

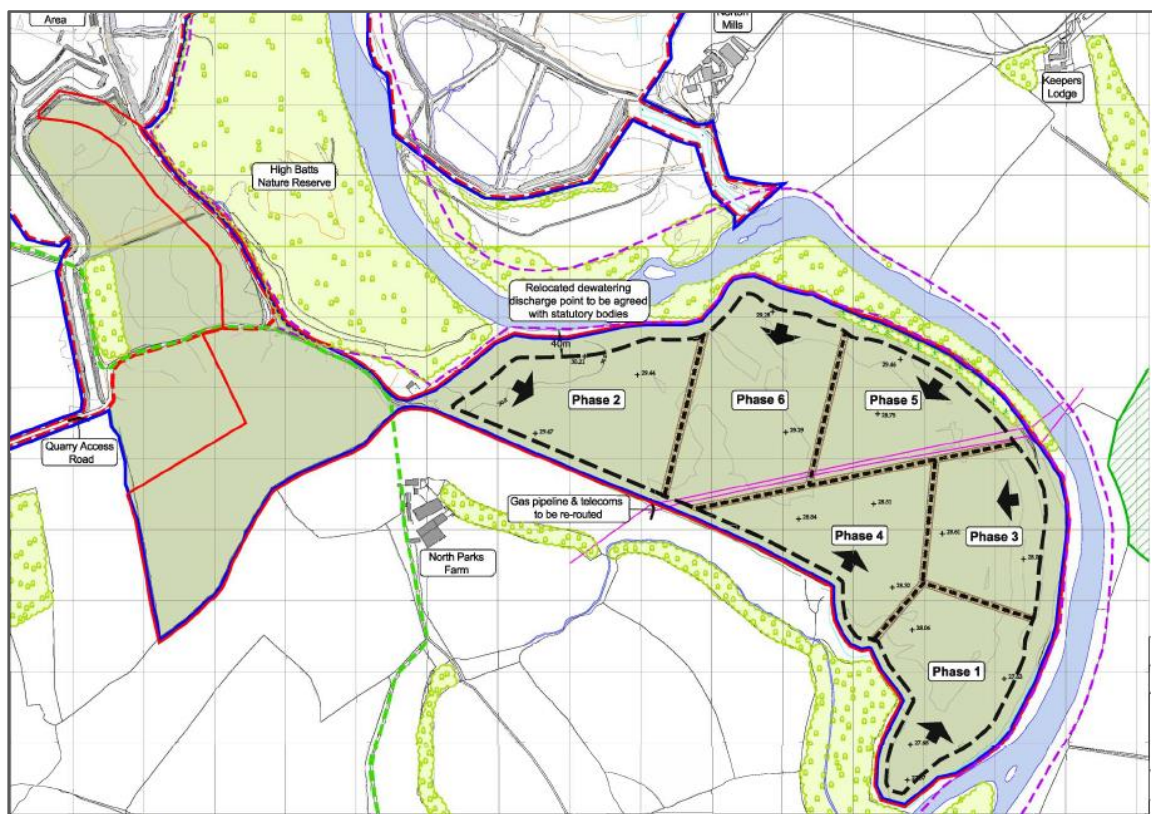
We had begun developing our ideas when the Quarry Life Award for 2018 was announced and we decided to enter the project, and were delighted to be chosen to participate. The structure of the competition helped to give us focus in our planning and to act as an impetus for action.

It is important to stress that whilst this project had a clear timescale, defined objectives and actions, it was conceived as the first phase of a much longer involvement in the site. This commitment to a continued partnership approach to work on site set the tenor of how we approached the project. We were not looking for quick wins but to develop methods, infrastructure and involvement which would provide significant benefits for biodiversity, for the quarrying company and for the community over years rather than months.

The Site

The Pennycroft quarrying extension began in early 2018 having been under detailed discussion since the submission of the Planning Application in 2011. Pennycroft is sited on the west bank of the river Ure, and to the north abuts High Batts Nature Reserve, which comprises 16 hectares of privately owned mixed woodland with open clearings and is part of Ripon Parks SSSI; the Reserve has existed for 45 years and is actively managed for biodiversity. The extraction on Pennycroft is to be undertaken in 6 phases as detailed in the map below, and is scheduled to last for up to 15 years with subsequent restoration to create a large 11 hectare lake with 4 hectares of shallow margins, and small shallow ponds, 1 hectare of reed bed habitat, 7.5 hectares of wet woodland, 7.5 hectares of mosaic habitat with bare ground, gravel areas, scrub and swamp and 1,150 metres of new native hedgerows.

High Batts was involved as a consultee during the application process and, given the proximity of the Reserve to the development, there were detailed discussions between Hanson and the Reserve Management about potential impacts on the Reserve's hydrology and ecology both during quarrying and after restoration. Both bodies undertook independent research and analysis which was taken into account in the final proposals. High Batts therefore has a significant long term interest in the future of the Pennycroft site, and in discussion with Hanson developed a proposal to offer practical assistance on site using our local and environmental knowledge with the aim of enhancing the biodiversity gain; these discussions led to the 'In at the Start' project.



The Pennycroft site showing the quarrying phasing and High Batts Reserve to the top left.

The project team

The project has been led by High Batts Nature Reserve which is a Registered Charity. It is a membership organisation with approximately 320 members and is run entirely by volunteers. Its core purpose is to work for biodiversity, and the Reserve is actively managed to conserve and enhance habitats and species. Access is restricted to members but pre-booked group visits are welcomed and there is an annual Open Day. The Reserve has a circular trail with three viewing hides, two overlooking the river Ure; a small shallow pool has been created from an incoming stream together with the third hide, as have two dragonfly ponds. There is a programme of bird feeding to support locally declining species such as Yellowhammers. A 10 year HLSS Management Agreement with Natural England concluded in 2018. There is a species recording programme for the Reserve and the wider Recording Area and the data is published in an Annual Report. Events are provided for members including a winter lecture programme.

A Project Management Team of 7 has overseen the project, collectively providing an extensive range of professional experience and skills; these include environmental stewardship, business, education and local government, academic research and project management. To deliver the project a further 35 volunteers were involved. Many came from High Batts membership, some came through events and publicity and some by

personal invitation. Some brought extensive specialist knowledge, others came to assist and to learn. Because of the ambitious and varied nature of the project we have needed a wide range of skills and talents, such as construction skills, project management experience, public presentation ability and environmental knowledge.

Involved groups

The organisations with which we have worked to deliver the project are:-

Harrogate Borough Council – provided support and grant funding
North Stainley Parish Council
North Stainley Sport and Recreation Trust
North Stainley C of E Primary School
Sharow C of E Primary School
North and East Yorkshire Ecological Data Centre
British Dragonfly Society Yorkshire Group; Keith Gittens
Butterfly Conservation Yorkshire Branch; David Wainwright
Botanical Society of Britain and Ireland; Dr Kevin Walker
Open Country Harrogate (providing opportunities for disabled people)
Community Payback Scheme
North Yorkshire Geodiversity Partnership/Yorkshire Dales Geology Trust
North Yorkshire and York Local Nature Partnership
Harrogate and District Biodiversity Action Group
East Dales Ringing Group

In addition we made a presentation to Harrogate and District Naturalists Society, and during the project we received visits from Cleveland Naturalists Society, Yorkshire Dragonfly Group, Bradford Environmental Education Service (Bradford YMCA group), Wetherby U3A Natural History Group, Leyburn U3A Bird Group and Kirby Hill Church Group.

Actions and Activities

Our project has had 3 main areas of activity:-

1. A programme of site monitoring to record changes in landscape, new habitats and changes in species populations
2. Public engagement through events and publicity
3. Working with schools to provide learning opportunities and interest in the project and the site.

Site monitoring

The aim of this activity is to produce a body of significant and scientifically valid ecological data over a long term, and we therefore spent a great deal of time researching and setting up a methodology which will deliver consistent and relevant data. We began by using GIS mapping to record the site, and plan our survey routes. The protocols for accessing the site were agreed with the Quarry Management and included a circular route around the perimeter of the extension site. The first months of activity involved work by the company and our Reserve volunteer team and some external groups to create this track to be used by photographers and species monitors. The Reserve has a comprehensive H & S Policy, and this was extended with new risk assessments and safety procedures for those involved in monitoring activities.

Our plan was to undertake drone photography to record the site and we secured a grant for the purchase of a drone camera, but we found that doing this ourselves was not feasible and that commercial services were too costly for our budget. We approached the North and East Yorkshire Ecological Data Centre who kindly

undertook this task for us without charge, and our intention is to continue such surveys on an annual or biennial basis as needed. In addition we began a programme of fixed point photography to record site changes. 8 sites around the route were installed with photography platforms each with guide rails to ensure that photographs are always taken from the same position and angle. Appendix 1 provides mapping and drone photographs.

We have undertaken four formal species surveys, i.e. breeding birds, butterflies, dragonflies and botany. We took advice from and used the methodology for these surveys from the relevant recognised body, i.e. British Trust for Ornithology, the British Dragonfly Society, Butterfly Conservation and the Botanical Society of Britain and Ireland. In addition to the formal surveys, monitors were asked to record all other sightings and to let us have any photographs which they took during surveys. The survey route for birds, butterflies and dragonflies also included a route through the Reserve in order to provide a comparator for the data from Pennycroft; to allow this, a new access path was created at the north of the Reserve by the Volunteer team in addition to the track around the extraction site. The full route for surveyors is 4.5 kilometres, and numbered 50 metre marker posts have been installed to allow accurate recording.

The botanical surveying is based on 5m quadrats which were created in 7 sites representing a variety of conditions on the quarry site as advised by Dr Kevin Walker of BSBI. Additional to the regular monitoring of these sites, two full walks of the whole area were undertaken by the botany recorders. Details of our monitoring methodology and survey route are included at Appendix 2.

We have also begun some controlled intervention work. In consultation with Hanson we have agreed a process for the seeding on the separate top soil and sub-soil stores to increase the number of plant species which attract insects and birds. We have also introduced some soil from an old beetle bank to the stand-off woodland area as the rare Thistle Broomrape has been known to appear near the river and favours areas of disturbed soil. We are also introducing some gravel from an area within the Reserve to a similar area on the quarry site in order to monitor natural versus assisted regeneration. We have been in discussion with RSPB officers about possibly including the site in the Turtle Dove Conservation Project which seeks to increase the amount of feeding habitat available to breeding and migrating Turtle Doves, the fastest declining British bird species. Our work on site has also included the management of the access track and areas around the surveying route and the installation of bird boxes for specific species such as Stock dove and Kestrel.

Recruiting and training volunteers to undertake the photographic and species monitoring started in late autumn 2017. We began by publicising the project to our membership via our Newsletter and we held a drop in session at the Reserve about the project. We followed this up with information to other organisations and individuals with environmental interests. In January we held an event for potential volunteers to describe in detail what was proposed and to get their feedback and final commitment. We also publicised the opportunities to get involved through our communications with the local councils and at our community Drop-in event, and were successful in increasing the number and experience of our volunteer team. Training was arranged for volunteers with specific sessions run by Dave Wainwright of Butterfly Conservation, Keith Gittens from British Dragonfly Society Yorkshire Group, and Dr Kevin Walker from the Botanical Society of Britain and Ireland. There were two training sessions for bird monitors run by Colin Slator who has extensive professional experience of organising BTO surveys.



*A training session
for bird monitors*

Our monitoring programme started later than originally planned. This was primarily because of difficult weather conditions well into April which delayed the whole of the quarrying operation. Also the phasing of the quarrying changed so that work began not on phase 1 at the southern end as planned but at phase 2 nearer the Reserve. Our initial plans had involved the building of a mobile hide to allow regular monitoring of the far areas of the site, but with the change in quarrying this task was put on hold. Instead our volunteer team from the Reserve began work on transforming a donated Portakabin to provide an Education and Training base for volunteers for which Harrogate Borough Council provided funding (and for the computer equipment for data recording). In late spring work resumed on the building of the mobile hide but because of the quarry phasing this has not yet been put to use.

Public engagement

Our first publicity for the project was at the Open Day held at the Reserve in October 2017 when Bob Orange, the Quarry Manager attended with a display to explain about the quarrying extension and restoration proposals, and Reserve volunteers staffed a display about the project and its objectives. 158 people came to the event and there was a good level of interest. In early December we wrote to all the local councils and the District and County Councillors about the project. We were disappointed with the responses with only North Stainley Parish Council expressing any interest but they invited us to make a presentation to them and they offered us support and provided us with various contacts which were very helpful in providing us with networks for publicity. We used our own website and that of the North Stainley Sport and Recreation Trust to advertise events and give updates on the project, and of course we kept a blog on the Quarry Life Award website. We set up a Twitter account for the project and through this developed have been in contact with a range of regional and national organisations involved in quarrying and nature conservation; these are listed in Appendix 3.

In early February we held a Drop-in session about the project for the community at North Stainley Village Hall. We advertised this event widely with our volunteers delivering over 350 leaflets to all the houses in North Stainley and West Tanfield. As a result of the event we recruited two new volunteers for the monitoring programme and felt that we had made contact with some supportive people.

In March we held a talks evening at North Stainley Village Hall, with three presenters, Adrian Kidd from the Yorkshire Dales Geology Trust talking about the geology of the area, then Stephen Moorhouse, on the historic landscape around Norton Conyers, and finally Bob Orange from Hanson Aggregates, talking about the potential of restored quarry sites for biodiversity. For this we had an audience of 31. In April the East Dales Ringing Group gave a demonstration of bird ringing on site, and there was a small exhibition about bird migration. This event had had to be postponed because of weather conditions and on the day conditions were not good meaning that we had only a small take up with 9 visitors. Later in April we ran a dragonfly identification morning at North Stainley Village Hall which was well supported with 19 attendees. In April we made a presentation about the project at a meeting of the Harrogate and District Naturalists' Society.

Our Open Day was held on 3rd June 2018, an excellent day with 137 visitors including many families. As in the previous year we provided a display about the project and took the opportunity to tell visitors about the project and the progress so far. In August, Yorkshire Day was celebrated with an event at Ripon Cathedral for over 200 dignitaries and the Chair of the Project Group made a presentation. Our final event was a walk around the quarrying site and the surveying route, explaining how we were monitoring and helping to manage it, and how the data created would be used in future restoration planning. 24 people attended.

Learning activities with local children at school and on site

We approached North Stainley Church of England Primary School in late 2017, and the Head Teacher was keen to participate in the project. We began with visits to the school assemblies to tell the children about the quarry and the project and engage their interest. In March we spent all day with the children as different classes visited the site. The older group planted a locally sourced Oak sapling in the woodland stand-off area to mark their involvement in the project.



After School Club learning about small mammal trapping

The After School Club for the school began after the Easter break and although our original plan had been to employ a Forest School teacher this did not prove feasible and we decided to use our own volunteers to deliver the programme. We held 7 fortnightly sessions for older children, and 16 joined the programme. They were given Club badges and information files with spotter sheets and other material. Apart from the initial session, all others were held on site with the children walking from the village. We began with bird identification, we held a bug safari, we learned about mammals and did some small mammal trapping, we identified plants on site and we did owl pellet dissections. We took full advantage of the good weather for the activities and postponed until

later in the year our plans for nest box and bughouse making. At the end of the programme the children were each provided with a certificate to thank them for their participation.

As a result of the work with North Stainley School, we were approached by Sharow Primary School, and we hosted class visits in April. Wath Primary School also contacted us and asked if we could include them in the work we were doing with North Stainley, but this was not possible at that late stage. The school has expressed an interest in being involved in future activities.

Discussion

We believe that our project began from an excellent foundation, with a good understanding between ourselves as project leaders and the quarry management, and with a shared ambition both for the project and for the site. We had a clear vision of what we wanted to achieve both during the timescale of the project and as a legacy that could continue to deliver benefits for biodiversity, for the company and for the Reserve, and for the community. We have achieved those objectives, though not all went to plan but we adapted as circumstances required.

Whilst being involved from the start was crucial to the project, it also made it more difficult to manage and deliver because of the many unknowns on the site. Similarly the weather pattern for the year with an extended winter and a very hot and dry summer provided us with challenges, and impacted in particular on our events programme. Whilst the weather delayed us, it did provide additional time for some of the planning work which ideally should have been tackled last year, but which was not possible because of the fluid situation at that time about the determination of the planning application.

One of the main factors in allowing us to complete this project successfully is the existing strength of the High Batts structure and volunteer base. We ran the project at minimal cost and with our usual practice of recycling materials whenever possible. The skills of our construction team (with some help with tasks such as welding from the quarry staff) and our weekly volunteer group were essential in allowing us to create access paths on site, set out marker posts and photographic platforms, create the new Education Centre and build a mobile hide, whilst at the same time continuing our Reserve management tasks. Our wide membership and our links with other organisations were also essential to the success of the project. Many of our members came forward as volunteers, and additionally other volunteers came from organisations with which we had links. We think that this network of environmental organisations helped to bring the project recognition and active support. It also meant that we were able to access advice and training support from official bodies, and to gain input from acknowledged local experts.

Recruiting involvement by the local community was less easy. The planning application process had been lengthy and involved much consultation and there was an impression that all the issues had been sorted for the majority of local people; those issues were to do with potential disruption rather than environmental concerns and therefore there was no immediate appreciation of the benefits of the project. However, those people who did come to events, and the local Parish Council were very supportive. The local school was similarly supportive and appreciative of the work we did with the children. We were gratified that the school consolidated the topics covered in our sessions with similar learning activities in school and in after school sessions. The response from the children was enthusiastic and they obviously enjoyed our sessions.

Our intention is to continue to develop our links with the local junior schools; we would also wish to build new relationships with secondary schools in Ripon so that the site can be used for GCSE project work and work experience by pupils. We also believe that there is much potential in the site for academic study and research and would wish to develop opportunities for University research projects based on the work we have done so far.

Another great strength which has underpinned the project has been the excellent relationship between the Reserve and the local quarry management based on many years of close working. The Manager has viewed us as “his eyes and ears” on site. His priority is the quarrying operation whilst we have concentrated on looking for opportunities to maximise biodiversity gain both during extraction and later. This allows us to look at potential interventions or test areas and to monitor results closely, rather than impose unquestioningly a blueprint solution drawn up from standard guidelines such as number of trees planted per hectare. We believe that adding the flexibility to try some experimental work on site adds enormously to a well-researched and relevant restoration but it does demand mutual understanding and trust from all those involved with the site.

Deliverables

Whilst the project has undoubtedly been successful, the real benefits will only come if we can use the experience we have gained and the assets we have created to continue the main activities of the project into the foreseeable future. For example, the data collected from one year’s recording is interesting and a useful record of the base position, but it will only become significant and valuable if the recording programme continues to measure impacts and trends, and if it is used to influence the restoration and the management of the site. Similarly the goodwill and involvement of the individuals and organisations we have engaged will dissipate if they do not perceive a clear forward plan for maximising their contribution.

The project has clearly demonstrated the potential for major benefits for biodiversity gain through the continuation of a range of activities on the Pennycroft site. We summarise those benefits as:

- A body of valid data resulting from a consistent monitoring programme which can be used to inform decisions about the restoration and the management plan;
- The availability of a trained and committed volunteer force to help with site management tasks and supervision;
- Building on the networks created to enhance co-operation between key conservation sites within the Ure Valley;
- Raising the profile of the site and widening its appeal to other bona fide environmental and research organisations to get involved.

Continuing the project in the long term would also offer the company benefits by:

- Providing a mechanism for the company to effectively meet its planning permission obligations;
- Allowing it to build new connections with environmental organisations and research bodies;
- Demonstrating the company’s commitment to partnership working in the interests of enhancing biodiversity.

As project leader, High Batts is keen to continue this project and build on its achievements. We have gained much by our experience over the last 9 months, and think that our involvement is helping us to achieve some long held ambitions in terms of getting more people working for wildlife, protecting and enhancing our local environment, and encouraging greater co-operation between those involved in working for biodiversity. We are aware however that a continuing involvement will put considerable pressure on the organisation, will need some realignment of our existing priorities and activities, and crucially, that we will need to take our membership with us on this venture. To do this requires a clear vision for the future, and a clear plan for how to get there and what our role is. Our ability to continue therefore needs agreement with Hansons about the nature of our partnership with them and a shared view of how our agreed aims can be delivered. One of the major elements in the successful outcomes from the project has been the good and trusting relationship we have with the quarry management and personnel on site. We would see as essential for successful continuation, a similar shared view between all levels of management within the company.

The situation at Pennycroft is of course quite unusual. It is not common to have a nature reserve adjacent to a quarrying site, and one that offers its resources to assist with a quarrying extension. However we believe that some of the outcomes from our project could be applied at other sites by engaging local organisations to share the vision for proposed sites and to get involved in achieving biodiversity gains. Regrettably the planning process, through its necessary formal procedures, can polarise opinions and make consultation and debate appear combative. We think that in most cases there is much common ground between environmental groups and quarrying companies about the benefits of quarry sites for enhanced landscapes and biodiversity. Whilst we are realistic and understand the economic pressures on companies and the requirements set for them by government and local authority bodies, we think that more meaningful discussion before planning applications are submitted and some acknowledgement of the importance of local knowledge could help to establish more co-operative arrangements.

For these reasons we are particularly enthused that the Ure Valley Quarry has been chosen for a 3 year iCASP project to develop an evidence-based decision support toolkit that will inform decisions on the management of mineral sites before, during and after extraction, and that this project intends to work closely with the In at the Start project to develop and validate the tool. We will be very happy to contribute our experience to this study.

Conclusions

This has been an innovative, ambitious and multi-faceted project requiring a high level of commitment, experience and skills from a small voluntary organisation. It has created a model that can be developed locally and demonstrated that it is possible to engender high levels of involvement by volunteers in working for biodiversity gain at quarry sites. The model has the potential for adaptation for use at other sites.

Encouraging involvement depends upon developing a clear sense of purpose and recognition of the value of the project, a task easier to accomplish with those already having environmental interest. Engaging significant levels of involvement from the local community takes longer, and building relationships with local schools and children will be important in this process.

Involvement by volunteers creates extensive opportunities for learning and skill development and the sharing of knowledge. Harnessing those skills, knowledge and enthusiasm to contribute to the development of the vision for the site brings major benefit in generating goodwill from the wider community, and provides the quarrying company with an enhanced reputation. It also offers the company additional resources to help monitor and manage the site, providing new ideas and specialist skills, and access to new networks.

Co-operative ventures of this nature must be planned for the long term if all the benefits are to be achieved. Sustaining high levels of volunteer input over a long period requires considerable effort and expertise however, and there may be the need for support from benefiting quarrying companies.

Schemes such as this can be exemplars of partnership working between the quarrying industry, environmental organisations and the voluntary sector. Partnerships need to be based on mutual respect, a clear understanding of individual roles and good communications. Such partnerships are in the interests of all and particularly important for achieving high quality landscape restoration, maximum biodiversity gain and public participation.

Appendix 1 Photographic images from the surveys

Appendix 2 Species Survey Methodology and Route

Appendix 3 Details of Twitter followers and responders

To be kept and filled in at the end of your report

Project tags (select all appropriate):

This will be used to classify your project in the project archive (that is also available online)

Project focus:

- ☐ Beyond quarry borders
- ☒ Biodiversity management
- ☐ Cooperation programmes
- ☒ Connecting with local communities
- ☒ Education and Raising awareness
- ☐ Invasive species
- ☐ Landscape management
- ☐ Pollination
- ☐ Rehabilitation & habitat research
- ☐ Scientific research
- ☐ Soil management
- ☒ Species research
- ☐ Student class project
- ☐ Urban ecology
- ☐ Water management

Flora:

- ☐ Trees & shrubs
- ☐ Ferns
- ☐ Flowering plants
- ☐ Fungi
- ☐ Mosses and liverworts

Fauna:

- ☐ Amphibians
- ☐ Birds
- ☐ Insects
- ☐ Fish
- ☐ Mammals
- ☐ Reptiles
- ☐ Other invertebrates
- ☐ Other insects
- ☐ Other species

Habitat:

- ☐ Artificial / cultivated land
- ☐ Cave
- ☐ Coastal
- ☐ Grassland
- ☐ Human settlement
- ☐ Open areas of rocky grounds
- ☐ Recreational areas
- ☐ Sandy and rocky habitat
- ☐ Screes
- ☐ Shrub & groves
- ☐ Soil
- ☐ Wander biotopes
- ☐ Water bodies (flowing, standing)
- ☒ Wetland
- ☒ Woodland

Stakeholders:

- ☐ Authorities
- ☒ Local community
- ☒ NGOs
- ☒ Schools
- ☐ Universities

In at the Start Project; Final report

Appendix 1

Photographic methods and images

Remote Sensing- RGB and Near Infra-red imaging by drone

Remote sensing has been widely used in ecological vegetation and habitat mapping, and repeated surveys are an excellent and cost effective way of mapping vegetation changes. The process has become more accessible in recent years as cameras and sensors can now be carried by UAVs (drones) rather than planes. The UAV is fitted with a very accurate GPS, and takes a series of detailed photographs with 70% overlap. These are 'stitched' together and give a photomosaic and 3D model.

As part of the project North and East Yorkshire Ecological Data Centre carried out surveys over the extraction area in the RGB Colour Model and also in near edge infra-red. Near edge infra-red can show up differences in vegetation not seen in the visible part of the spectrum.

Fixed Point Photography

This is a simple way of recording visual changes in vegetation and landscape over time, and is used worldwide for ecological monitoring. The value of the technique increases with time and repetition, and it is useful for monitoring both natural changes and ensuring that habitat management interventions are giving the desired results.

In the case of the Pennycroft quarry extension, the fixed points are placed to capture the changes inside and outside the extraction area. There are eight fixed points set up on fence posts, each has a horizontal platform with 5 or 6 aluminium guides set in an arc. When photographs are taken with the camera back placed against each guide in turn, with appropriate software, they can be 'stitched' into detailed panoramic views. Over time they give a detailed comparative record of any changes in vegetation and landscape.

Figure 1 Lidar Image – Digital Terrain Model

Figure 2 Image from Drone Survey (RGB)

Figure 3 Image from Drone Survey (Infra-red)

Figure 4 Detail of fixed Photographic Point

Figure 5a Panorama shot from Photographic Point 1 in March

Figure 5b Panorama shot from Photographic Point 1 in July

Figure 1
Lidar Image

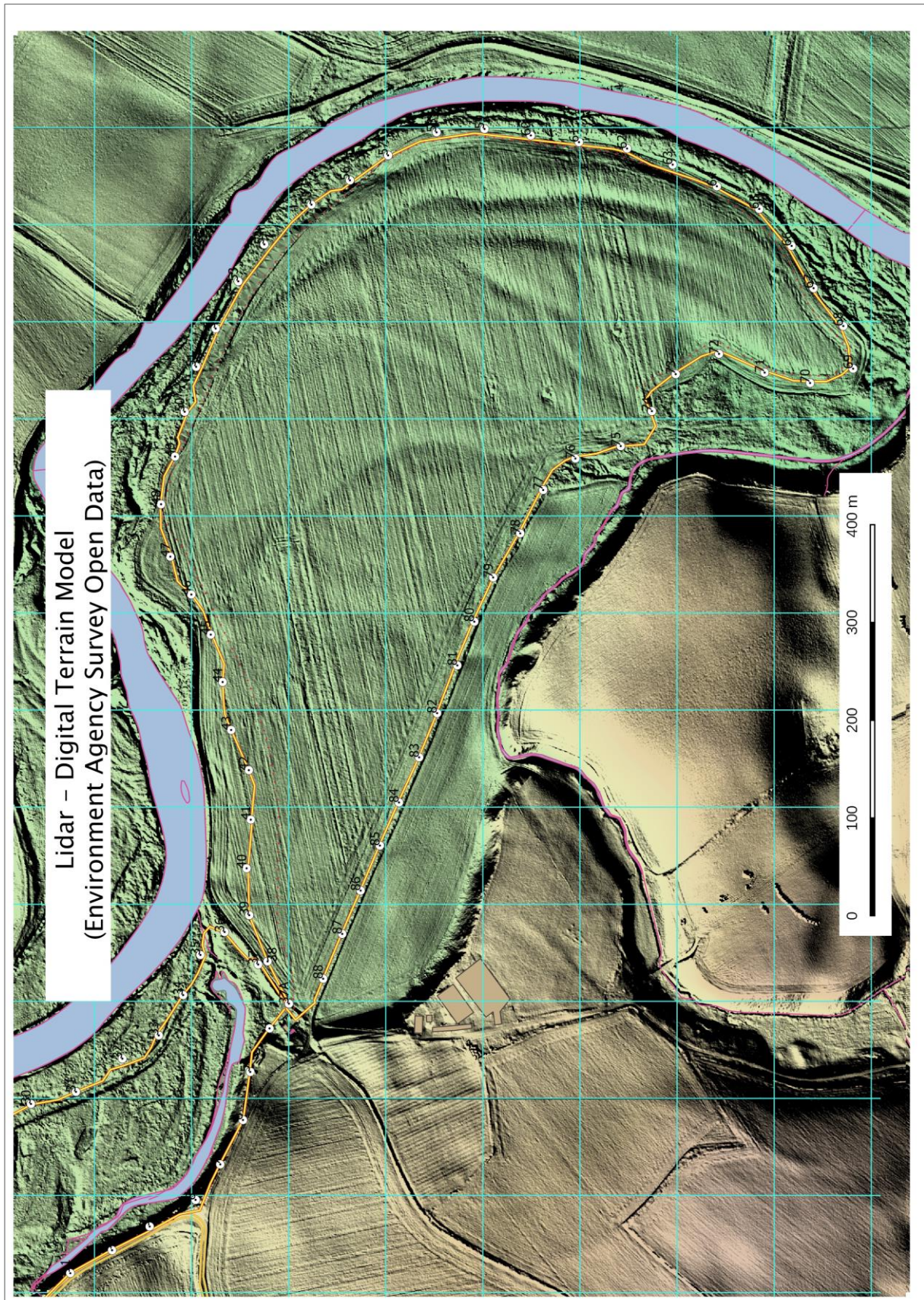


Figure 2
Drone survey (RGB)

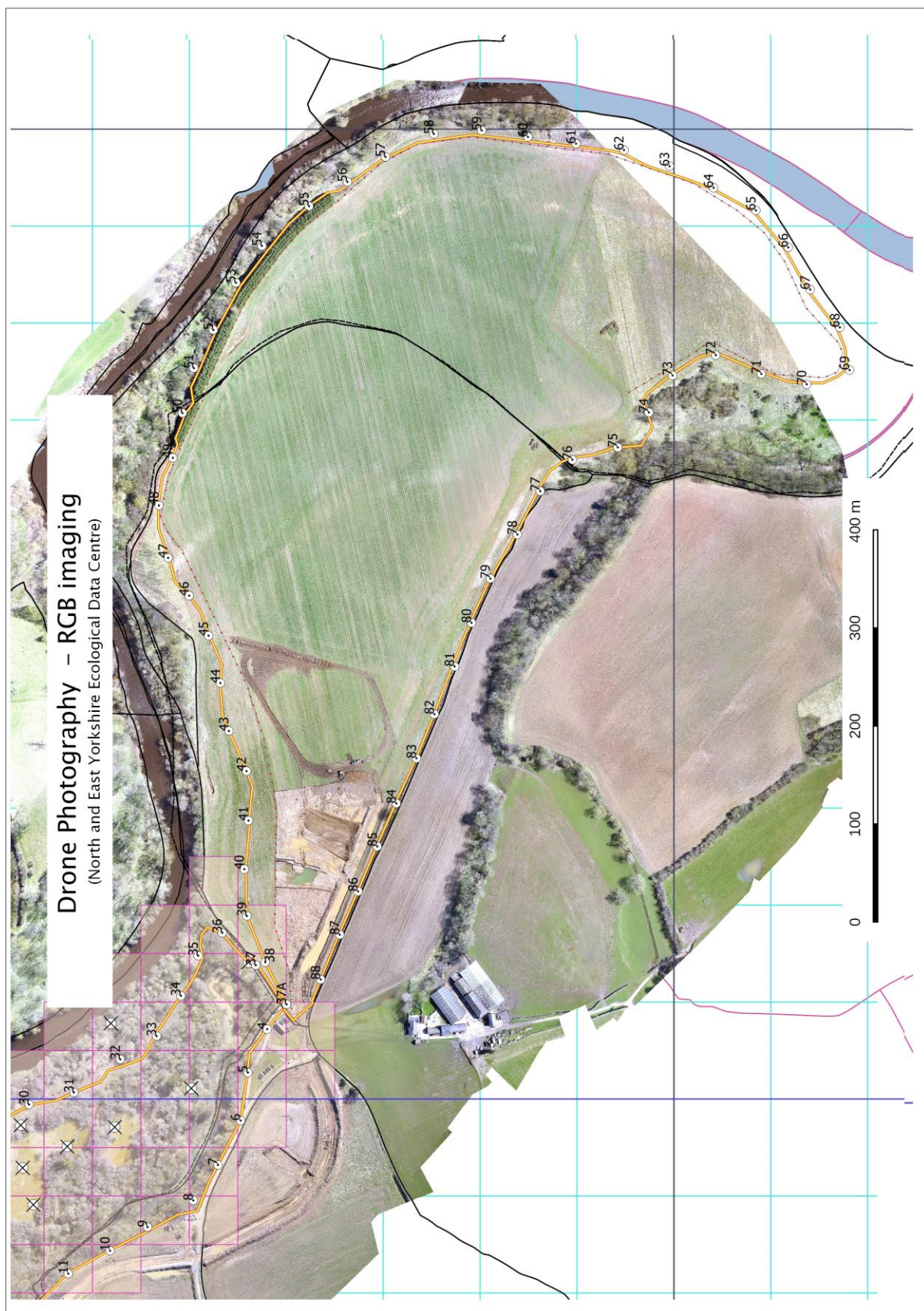


Figure 3
Drone survey (Infra-red)

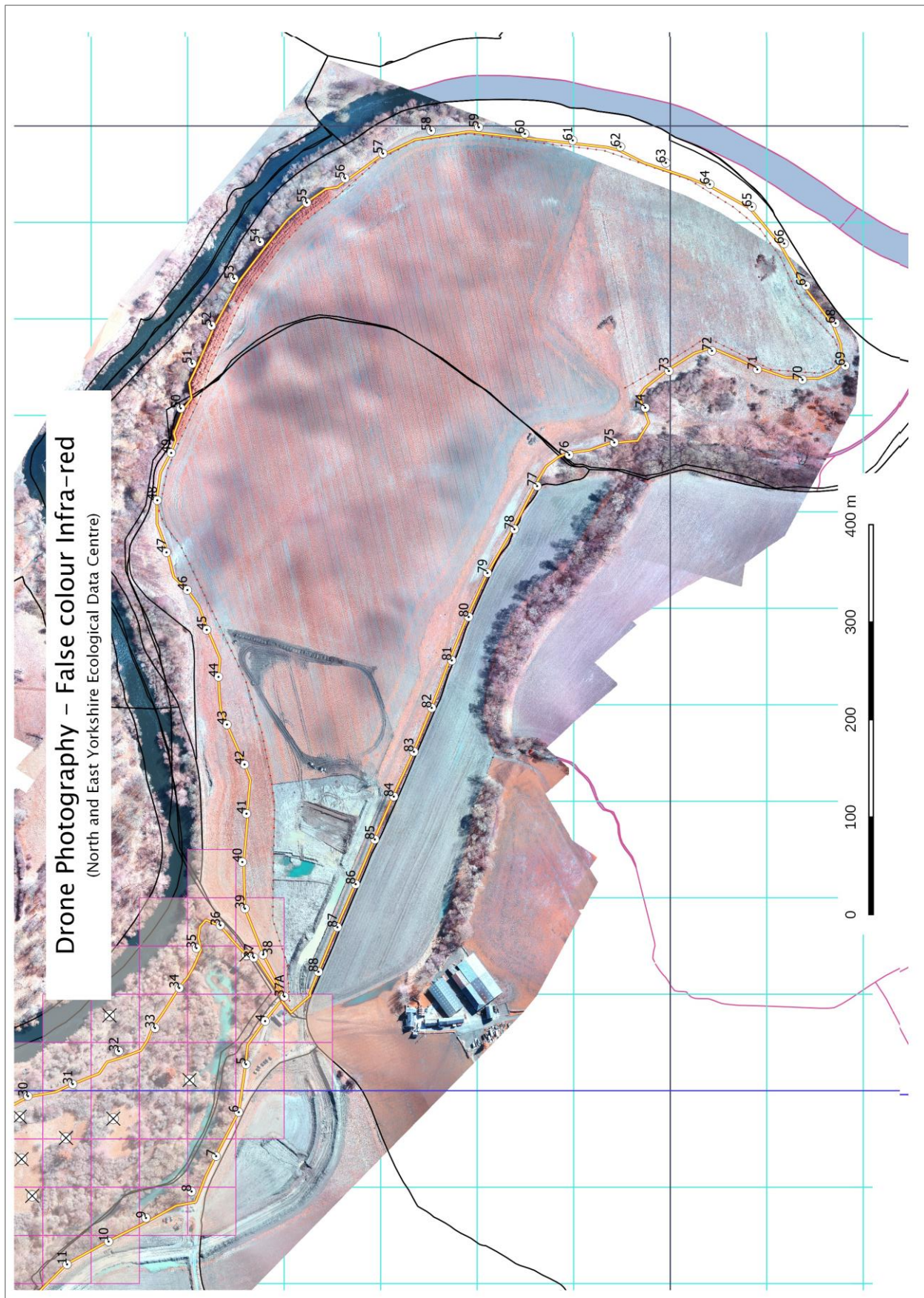


Figure 4
Detail of Photographic Point





Figure 5a
Panorama compilation from shots taken from Photographic Point 1 in March 2018



Figure 5b
Panoramic compilation from shots taken from Photographic Point 1 in July 2018

In at the Start Project; Final report

Appendix 2:

Species survey methodology and route

Figure 1 at the end of this appendix shows the surveying route created around the quarrying site and its extension into High Batts Reserve together with the numbered distance marker posts. **Figure 2** shows the location of the quadrats used for botanical monitoring and the site of the fixed photographic points. **Figure 3** gives more detail on the standoff woodland area, botanical quadrats and pitfall traps.

Volunteers were recruited and trained to undertake four formal species surveys, i.e. breeding birds, butterflies, dragonflies and botany. Training sessions were held on identification, survey methodology, site protocols and survey routes. Surveyors worked in pairs, signed in at the beginning and end of their sessions, and in addition to recording as part of the survey, they also submitted records and photographs of other sightings. Because of weather and site issues our surveys started at the end of April rather than 4 weeks earlier as originally planned.

In addition to the formal species monitoring, all sightings by volunteers working on the Pennycroft site have also been recorded.

Our volunteers have also constructed a mobile hide which we can move to different areas of the site according to opportunity. A photograph of the hide is given at **Figure 4**.

Bird surveying

We chose to use the methodology from the Common Bird Census (CBC) drawn up by the BTO. The methodology was successfully used for almost 40 years, but CBC has been superseded by the Breeding Bird Survey, primarily because both the fieldwork and the analysis were time consuming and it could be difficult to recruit volunteers. We decided that CBC was best suited to our project because our scale of operation in terms of surveying and analysis time is not large, we will be consistently monitoring the same area over many years, and critically, we might be using different routes across the area as the quarrying and restoration proceeds which does not favour a methodology based on fixed transects.

Using the CBC methodology we have undertaken a breeding bird survey across the Reserve and Pennycroft using the marked survey route provided with numbered 50 metre marking posts and covering a distance of 4.5 km. The survey was undertaken from late April to the end of July with teams visiting on a weekly basis and making 14 visits in all. All contacts with birds, either by sight or sound, were plotted on maps, using codes to note each bird's species and to record activity indicating breeding such as song or nest-building. Sightings of other bird activity not related to breeding behaviour was also noted on a separate record sheet. Surveyors were also encouraged to take photographs where possible.

Butterfly recording

Our methodology is based on the UK Butterfly Monitoring Scheme (UKBMS), and includes recording all sightings seen on a visit along the whole of the surveying route through the Reserve and Pennycroft. In addition we also created two transects in Pennycroft, one in the standoff woodland (posts 37 to 47) and one at the southern end of the Reserve from posts 63 to 73 using the “Pollard Walk” system of the UKBMS which is designed to sample the same area over a number of years. Butterflies are recorded in a fixed width band (approx. 5m wide) along the transect each week from April until the end of September yielding, ideally, 26 counts per year, though weather conditions have to be taken into account usually resulting in fewer annual counts. Our monitors began in early May and made 11 visits. The transects on Pennycroft were chosen with advice from David Wainwright of Butterfly Conservation and we are using the documentation from UKBMS to record sightings.

Dragonfly recording

The British Dragonfly Monitoring Scheme is the basis for our recording activity with visits, when weather conditions are favourable, to record all sightings around the whole survey route. In addition we have established one transect from posts 17 to post 26 at the northern end of the Reserve covering the area from the Silt Lagoon to the Dragonfly ponds. We have not established a transect on Pennycroft because currently there is little dragonfly presence and we can record that from the survey route walk; also as the aim is to record consistently over the same transect for several years we need to gain more experience of the site to choose the best long term option for transect creation. Our monitors undertook 5 surveys between May and August.

Botanic recording

The aim was to design a scientifically valid survey, checked by staff of NEYEDC (North & East Yorkshire Ecological Data Centre), which will enable us to follow the botanical changes in Pennycroft as the quarry develops. On the advice of Dr Kevin Walker of BSBI (Botanical Society of Britain and Ireland) we selected 7 different habitat zones around the new quarry.

- A very gravelly area which had been in arable cultivation. (6 possible plots)
- Old regeneration, no new planting. (4 possible plots)
- Newly planted area of trees for wet woodland (7 possible plots)
- Arable edge, drilled with barley (6 possible plots); this habitat was a thin strip, and the plots had to be twisted slightly off N-S to fit them in.
- Old regeneration, very sandy uncultivated area near old set-aside and game cover area (6 possible plots)
- Uncultivated area near the Light Water stream. (10 possible plots)
- Very sandy, gravelly uncultivated area. (6 possible plots)

Three 5 x 5m plots were marked out in each habitat, and 1 of these chosen randomly to be the botany survey plot which would be surveyed twice a year using the methodology of the National Plant Monitoring Scheme, recording species, abundance, height, bare ground etc. Two visits a year in spring and summer are made to make identification of the plants easier, and to cover early and late emerging species. Volunteer surveyors were recruited, both from the established Nidderdale AONB botany team and from High Batts members.

This is intended to be the start of a long term monitoring programme, to inform our aim of increasing biodiversity on site. All the plots have been surveyed twice in 2018, providing valuable baseline data, and we intend to continue the survey as the quarry develops. The initial surveys show large variations in the number of species present, between 6 on plot 4 (one of which was barley) and 32 on plot 5.

IATS plot selection methodology

Aim

To select plots for use in botanical and other surveys in a robust and statistically valid way.

Method

Seven different habitat zones were indicated by Dr Kevin Walker in the area of Pennycroft surrounding the quarry. The total representative area of each habitat was roughly mapped on paper, and marked with 5 x 5m plots orientated N-S wherever possible. This gave from 4 plots in the smallest, to 10 possible plots in the largest habitat.

All potential plots were numbered and 3 numbers selected at random to avoid bias. The 3 plots so selected in each habitat were marked out, with a permanent survey peg at the SW corner, and wooden or plastic markers on the other 3 corners of the plots.

One of the 3 plots was again chosen at random to be the botany survey plot for each habitat. Having 2 'spare' plots per habitat allows for the expansion of the botanical effort, i.e. replication within habitat, or provides randomly selected plots for looking at other organisms e.g. insects, lichen, fungi.

Figure 1
Survey Route

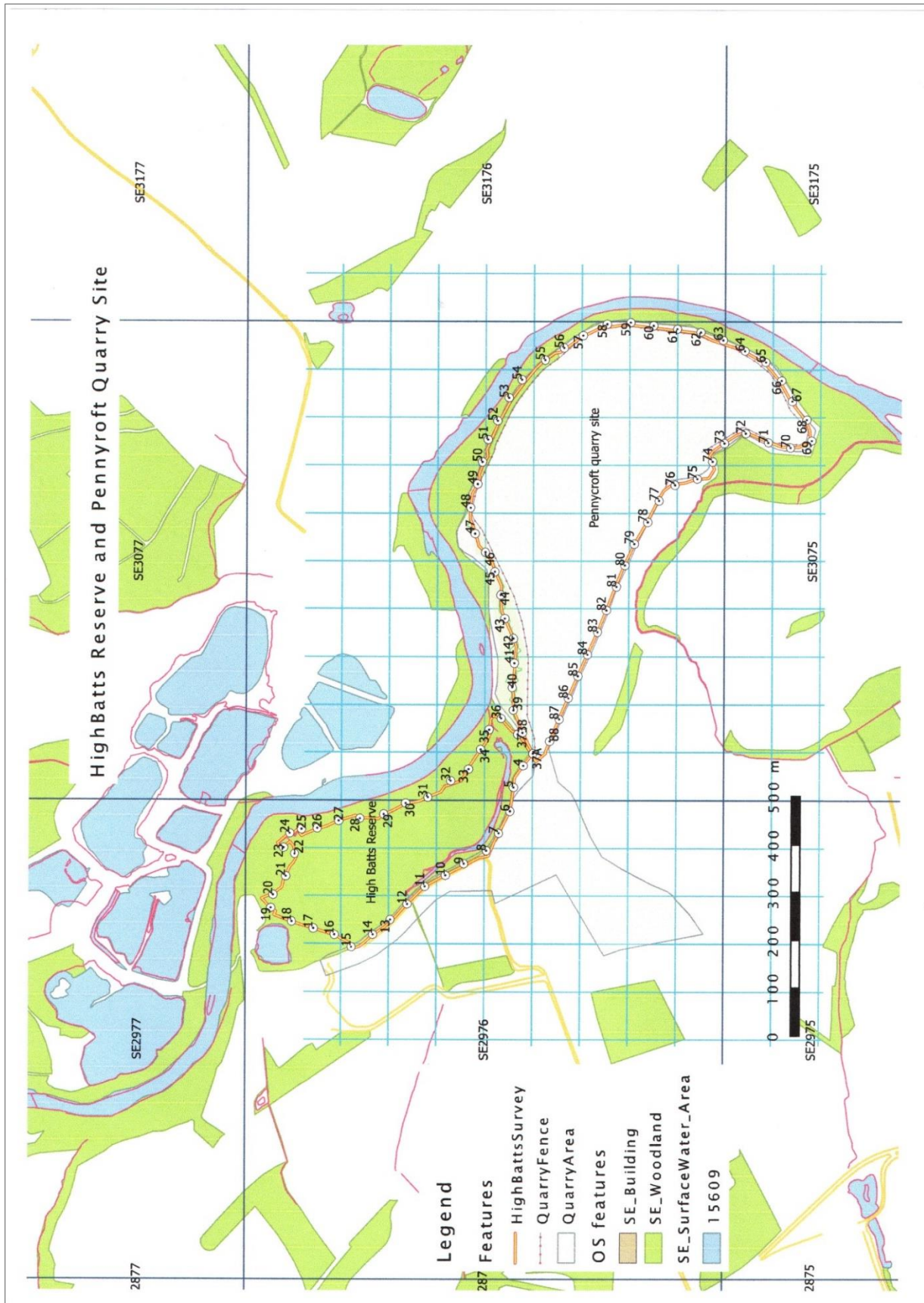


Figure 2
Botanical Quadrats & photographic points

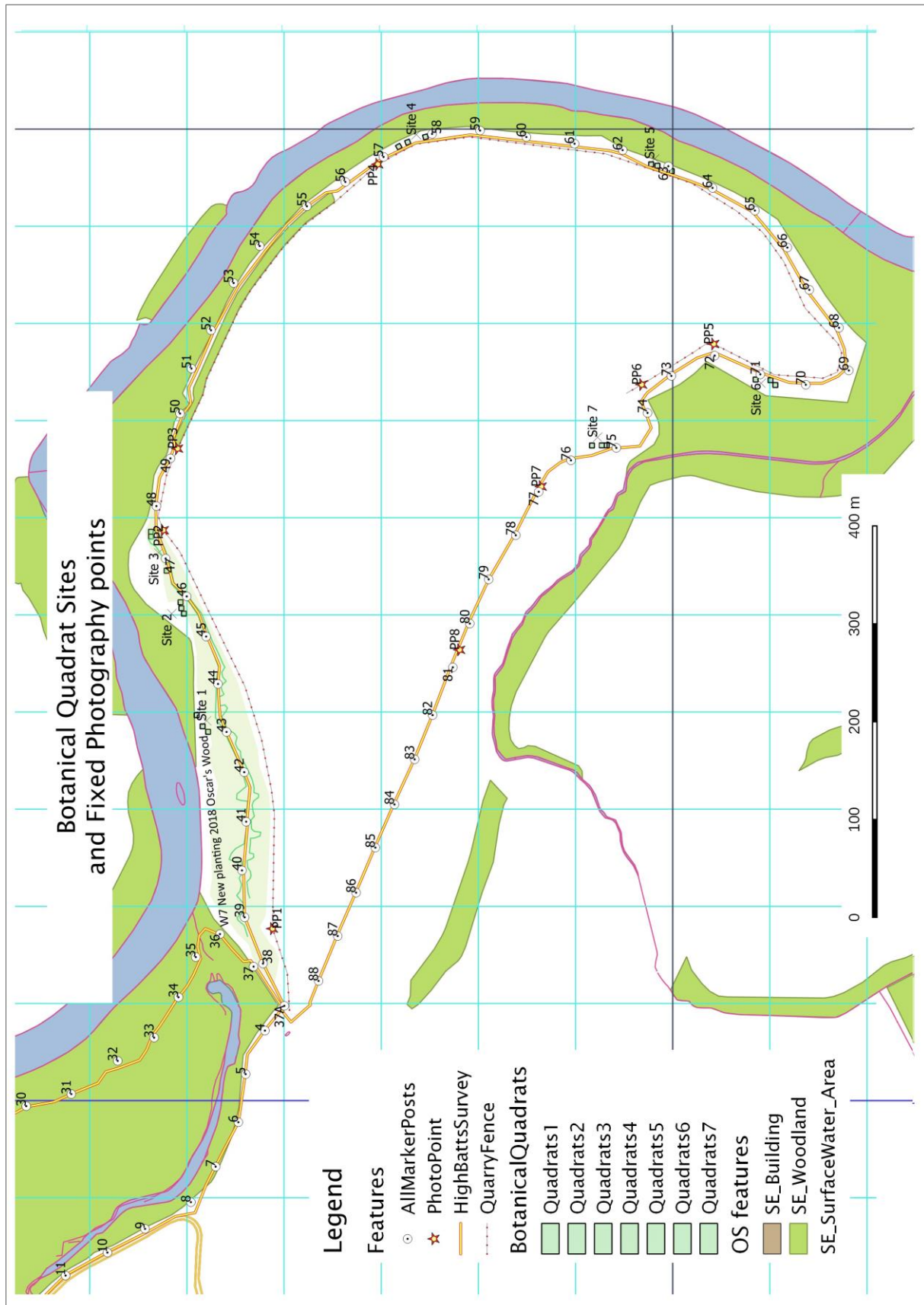


Figure 3
Standoff woodland

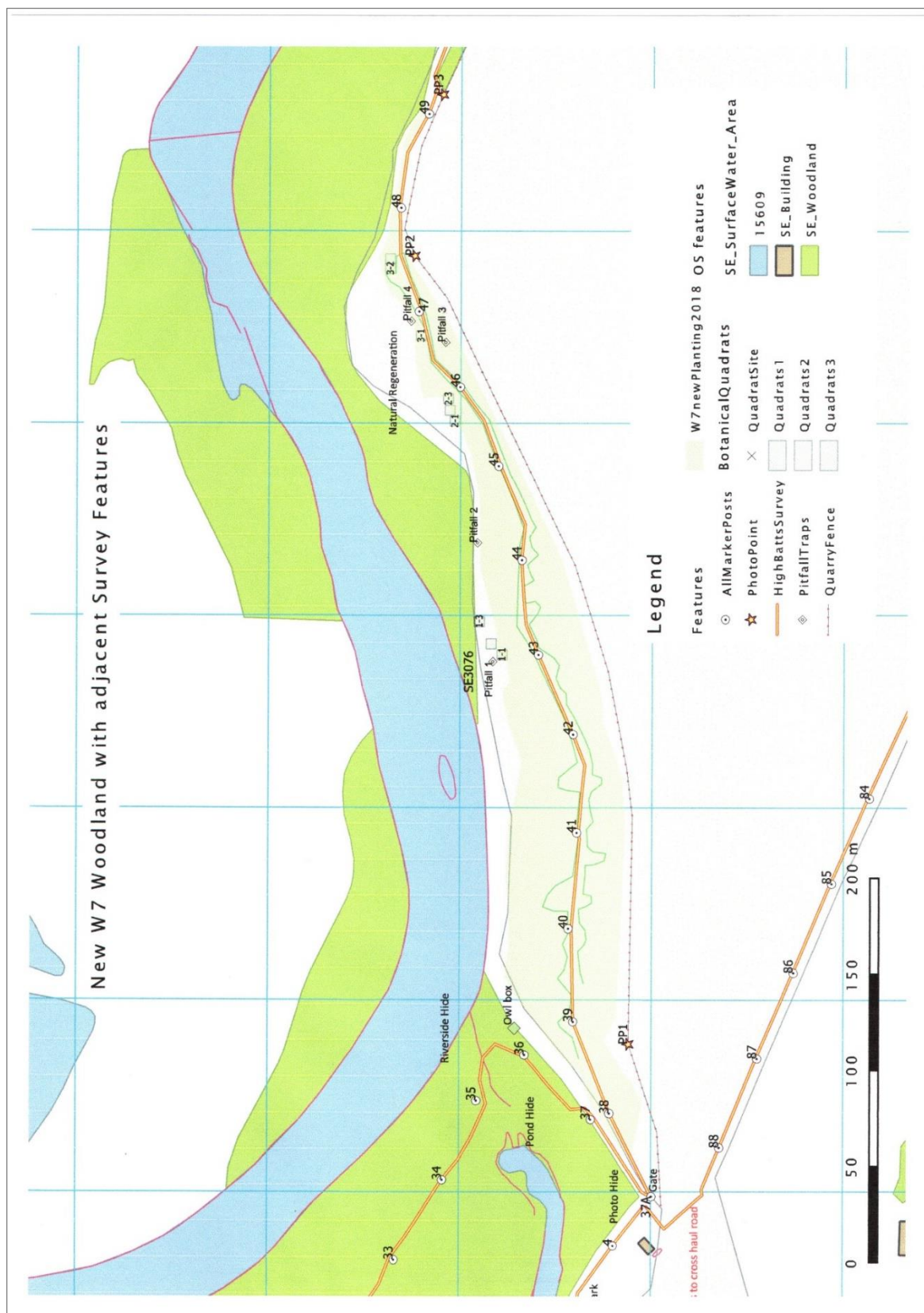


Figure 4

**Mobile hide on site near
Phase 2 workings**



In at the Start Project; Final report

Appendix 3

Social media followers and responders

Twitter started Jan 2018. 81 Tweets to date

Organisations following "In At The Start" on Twitter

- BSBI - Botanical Society of Britain & Ireland
- Hanson UK
- Hanson UK QLA
- Harrogate Biodiversity Action Group
- Merseyside Biobank
- Nature After Minerals
- North Yorkshire Bird News
- Nosterfield Local Nature Reserve
- Quarries and Nature
- Quarry Life Award

Additional organisations who have responded to tweets

- ALERC – Association of Local Environmental Records Centres
- British Nature Guide
- Butterfly Conservation
- CedarNI – Centre for Environmental Data & Recording Northern Ireland
- Connecting for Nature
- Froglife
- Hanson Careers
- Heidelberg Cement ES
- Institute of Quarrying
- Natural History Society of Northumbria
- Nidderdale AONB
- QPANI – Quarry Products Association Northern Ireland
- RSPB Northern England
- Wildflowerhour
- Yorkshire Dragonfly Group