

Flight of the Fritillary

Emma Rothero

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Key staff: David Gowing, Irina Tatarenko, Mandy Dyson, Mike Dodd

Contact point: Emma Rothero 01908 655645

Aims and scope of your project

- What were the main aims of the project?

North Meadow is owned and managed by Natural England, and is home to 80% of the UK's remaining populations of this rare flower. Each April, Natural England manage many thousands of visitors who come and see the fritillaries in flower.

The FMP data collection has been done using volunteers through an annual fritillary counting day. The information collected has been entered into a database and trends of change noted. Management recommendations are fed back to the site manager to try to ensure that the site maintains its wildlife value, and over the years the numbers of plants has been steadily increasing.

Recent Dutch research showed that their fritillaries are pollinated by bumblebees. We wished to observe bumblebee behaviour on several key sites to see whether they follow this pattern, and also set up a mechanism to survey the bees themselves. These pollinators may be essential for the survival of fritillaries, and it is widely reported that they are declining in the wider countryside. Could this be an increasing problem for the survival of the UK populations of snakeshead fritillary? What benefit may the early flowering fritillary have for bumblebee populations and thus for an important ecosystem service: crop pollination.

We had no knowledge about whether the trend for increasing fritillaries at North Meadow is due to management changes, the wider climate or other factors or in fact whether fritillaries are in fact decreasing elsewhere.

We wished to develop all this work through an expansion of the volunteer population, and to determine whether we could engage volunteers over a longer time frame, assessing their level of interest and engagement in the project as well as developing a mechanism for assessing the quality of the data collected by the citizen scientists that we planned to train.

Data generated by the project is already used in UG courses and supports five current PhD students. The project planned to address the eSTEEeM manifesto in terms of public engagement and entrepreneurship.

- What were the more specific goals

We wished to:

- Increase the numbers of volunteers at North Meadow through wider advertising improved engagement and better feedback of results.
- Look at the other sites where fritillaries are currently counted and work with site managers and volunteers on at least two of those sites to encourage data collection in a standard way as well as assisting volunteers to compile and share their existing data.
- Provide information on the specific pollinators of fritillaries to volunteers, thereby encouraging them to collect information on which species are involved and to understand their behaviour better.
- Analyse the data collected and feedback findings to volunteers through feedback sessions, website and leaflets, thereby increasing levels of engagement.
- Assess the level of engagement of the volunteers through observation, interviews and feedback questionnaires.

Activities

- What was the overall approach (e.g. observe current practice, develop technology, plan and evaluate change, etc)

Our overall approach to this project was to work in partnership with local conservation and volunteering organisations to establish two new sites where we could undertake monitoring activities with new volunteer groups. We consulted with the Bumblebee Conservation Trust and worked with them on the appropriate method for bumblebee survey at our sites. We wished to engage volunteers not just through encouraging them to take part in the surveys, but also by running annual workshops to present the data they collected, and encourage discussion on the findings and next steps. As well as collecting high quality data, we wished to assess the level of engagement of the volunteers. We did this through on site interviews, workshop observation and questionnaires.

- What were the planned activities of the project?

To widely advertise the activities to encourage the involvement of new volunteers.

To develop a new webpage about snakeshead fritillaries and update the FMP website with information about the project.

To run an annual fritillary count day on 3 sites across the UK, using groups of volunteer surveyors, collecting data from 400 1 x 1m² quadrats on fritillary plants.

To support three groups of bumblebee surveyors across the the sites, undertaking surveys monthly from March to October each year, feeding back the results to the Bumblebee Conservation Trust.

To run an annual winter workshop for each site, to present the results of the surveys in each year and encourage debate and ideas about the research and the organisation of the survey activities.

To undertake a programme of evaluation of volunteer engagement and learning to understand why different groups of people volunteer and what are their reasons/motivation for doing so?

With this information we planned to:

1. Target similar groups next year and/or target other groups not represented so as to inspire a greater range of people to take an interest in nature conservation and environmental protection and provide them with knowledge of scientific methods and study.
2. Encourage volunteers to be involved with the project in the longer term with respect to data collection and the environmental and conservation implications of the results of their work

- What changes did you have to make to your plan (aims, project activities, etc.) and why (e.g technical problems, difficulties in involving users/stakeholders, etc)?

We had difficulties gathering information about the volunteers in the first year. The equipment (dictaphone) used for interviews on site was inadequate to hear responses (too much background noise), and the time involved in interviewing volunteers was not sufficiently allocated to capture all individuals during the first year of the counts.

Additionally the project manager went on maternity leave during the last year of the project, which delayed completion and resulted in a short interruption. Volunteer interviews did not occur therefore in year 2 of the project, which would in some ways have replaced the poor response in the first year.

- What data and evidence did you gather and how did you gather it (e.g. survey, interviews, focus groups, user studies, cultural probes).

Volunteer engagement information

Year 1 – recorded interviews from some volunteers and video interviews by OU media team

Winter workshop

Summaries of workshop discussions following prompt questions (notes taken by an independent observer)

Names and number of volunteers attending activities

Year 2 – Workshop

Names and number of volunteers attending activities

Year 3 – feedback questionnaires from volunteers.

Workshop (to be run Feb 2015)

Names and number of volunteers attending activities

Ecological information collected

Each year we collected 400 1 x 1 m² quadrats worth of data on snakeshead fritillaries. We walked monthly bumblebee transects at 3 sites

Findings

- What are your main findings? What evidence supports these findings?

Volunteer engagement and evaluation

Volunteer numbers

Our volunteer numbers increased significantly as a result of advertising and publicity. The graph shows numbers attending each event (the funded eSTEeM project started in 2012):

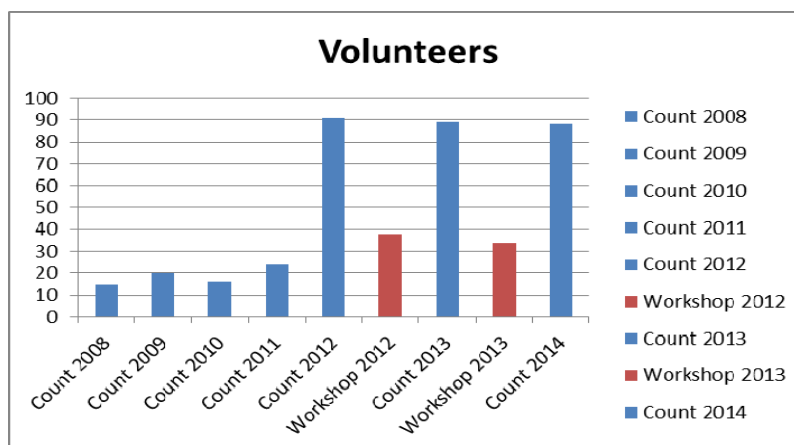


Fig. 1. Volunteer numbers from 2008-2014

Volunteer retention

Figures 2 and 3 show the numbers of volunteers returning to count for one, two or three or more times. This shows that we have developed a core of volunteers who are committed to returning to the surveys each year.

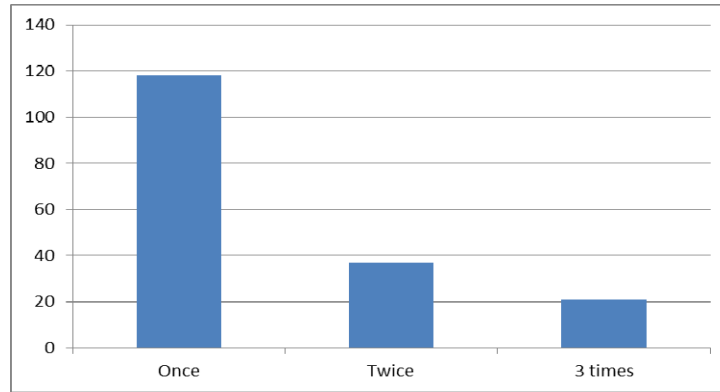


Fig. 2. Volunteers returning to count from 2011-2014

Similarly for the workshops:

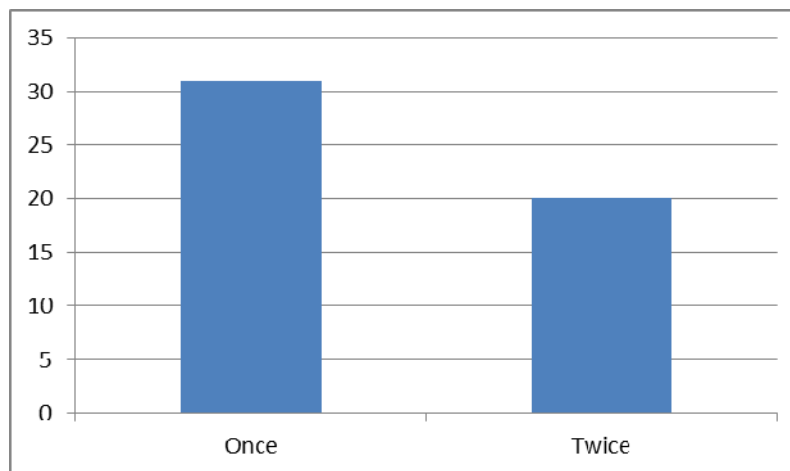


Fig. 3. Volunteers attending workshops once or twice from 2011-2014

Volunteer interviews

Our first year interviews were not really wide ranging enough to enable any conclusions to be drawn. Those captured however all indicated an interest in winter workshops, which resulted in the workshops going ahead. We do also have a series of video interviews recorded as part of the REF submission from volunteers on one of the fritillary count days (North Meadow), undertaken by the OU media team. These are available to see at...and the transcriptions are attached in Appendix 1.

Our independent workshop evaluation from the first workshop is available as an attachment (Appendix 2) and demonstrates that the attendees had a good understanding of the project and were broadly positive about further workshop type activities.

Volunteer questionnaires

The year 3 questionnaires were very illuminating in terms of understanding volunteer engagement and learning. The summary of responses is attached (Appendix 2), the headline figures are:

How effective was our advertising?

New groups established and maintained but 88% by word of mouth

New recorders?

No - 87.5% done natural history recording before

Improved skill sets?

Yes - 88% thought they had improved their skills in natural history recording

Improved environmental knowledge?

Yes - 65% said had improved knowledge of conservation and environmental issues.

Engaged volunteers?

Yes - 54.4% would like to get involved in other aspects of the project

81% had found out more about the project

100% enjoyed the days , would do it again and would recommend them to others

Indicators of understanding and engagement also come from some of the comments on the questionnaires. For example this comment demonstrates that the volunteer has a good understanding of the method of survey sufficient that they are able to suggest where there might be errors in recording from newcomers:

'perhaps new comers should be checked that they really can spot the single leaf samples'.

The full interview responses are found in Appendix 3.

Ecological findings

Our citizen scientists have demonstrated that dormancy of at least one year is possible in *Fritillaria meleagris*, information not previously quantified. This was triggered by extreme flooding conditions in the previous year. This information will help with management of key conservation sites.

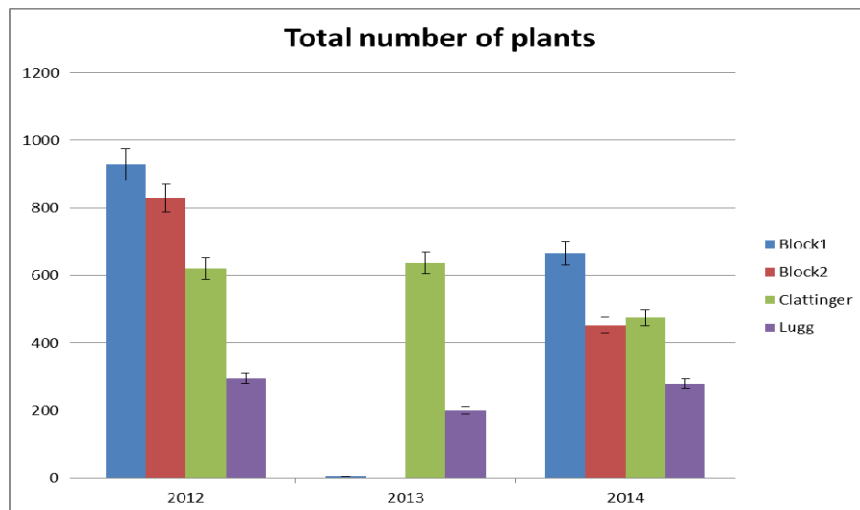


Fig. 4. Total number of plants counted by volunteers across 3 sites 2012-2014

We have demonstrated the range of bumblebee species visiting floodplain meadows throughout the season, and found a rare species not previously recorded in Herefordshire.

We have also demonstrated that volunteer counts are sufficiently accurate to be considered as valuable scientific data, as our re-counts of 15% of the quadrats demonstrate no significant difference, except for at one site in one year, where we had a problem with the quadrat alignment and need to address how this is dealt with in future years.

- Do you have you any particular successes to report?

A new finding about the population ecology of snakeshead fritillary with generation of national media interest about this finding.

- Has your project generated any unanticipated outcomes or unexpected opportunities and how have you taken account of these?

As above, we could not have anticipated the extreme weather event that led to the dormancy of nearly 1800 individual plants, however the benefit of such long term recording means we had some context for this finding and were able to evaluate its meaning. We were also invited to make a short film about the project by the media team to promote the research undertaken by the OU.

Impact

a) Student experience

- In what ways has your project impacted on student learning?

Our fritillary dataset was used by a successful MPhil student Fiona Cameron to complete her study on Ontogenetic shifts within floodplain meadow species (2014).

Our project was however mainly focussed on volunteer engagement and learning rather than OU students specifically, although we did advertise it to students and had some attendance from this cohort. We think the project has impacted on volunteer learning as the feedback questionnaires demonstrate. However we do not have information on whether this has developed through to more formal learning.

- How is your project contributing to increasing student success (i.e. retention, employability, etc.)?

Our project was focussed on volunteer retention rather than OU students specifically. Our feedback questionnaires and volunteer attendance suggests we have successfully engaged volunteers, encouraging them to return to surveys and to attend workshops.

- Have there been or will there be any benefits to students not directly involved in your project?

Our data is used in S396 to allow students to develop analytical skills of exploring data and using correlation to develop hypotheses.

b) Teaching

- How have you affected the practice of both yourself and others within the OU?

The project has highlighted where improvements in monitoring methods are required.

- What has been the impact of your project outside the OU?

We have had a good amount of impact externally as our project was largely focussed on engaging partners and volunteers external to the academic environment. We have engaged with Herefordshire Nature Trust, Wiltshire Wildlife Trust, Plantlife, Natural England, Bumblebee Conservation Trust, the Environment Agency, Kew Gardens, University of Brighton, Botanical Society for the British Isles, and a raft of individual volunteers in developing and delivering this project. As a result we have become known as a centre for expertise on the ecology of snakeshead fritillary and a hub for information exchange about this species. There is a significant amount of interest about this species amongst the wider public due to the unusual and beautiful flowers, its rarity and its visual appearance en masse in April at a time when there is little colour in the wider countryside.

We have had articles in national broadsheets and local papers. We were selected by the British Ecological Society to talk at their 2014 conference, and our project was promoted by them as one of only 2 across the conference talking about citizen science in France and Britain. We have also talked about the project at other conferences and in presentations, including the National Co-ordinating Centre for Public Engagement (December 2014).

Internationally, the project was presented at conferences (Tatarenko et al, 2013 and Rothero et al, 2013) on biodiversity in Russia (Moscow, Kaluga, Cherepovets) and Belarus (Minsk) where it was recognised as an innovative approach and attracted a lot of interest from environmentalists, and lecturers and students at the Universities

c) Strategic change and learning design

- What impact has your work had on your Unit's or the University's policies and practices.

This project was listed in the REF submission as engaging the wider public in research where it formed part of an impact statement that was used as an example for others to follow.

List of deliverables

Please provide a list of any deliverables that will be of value beyond the life of the project such as websites or Wikis (URL), publications (pdf), papers (pdf), etc. Please reference papers and publications in full. Relevant files should be sent separately for inclusion on the eSTeEM website.

Website; specific web page dedicated to this project.

<http://www.floodplainmeadows.org.uk/content/snakes-head-fritillaries>

A fritillary leaflet, used to provide general ecological information about the snakeshead fritillary and the project, distributed as part of guided walks and meadow open days to the general public. Also available on the website.

Floodplain Meadows Partnership Technical Handbook (in draft) in which this work will comprise a case study. The externally-funded publication will be distributed widely amongst the professional conservation community and local groups with an interest in floodplain meadows more widely.

Figures and tables

List of figures and tables provided in the report.

Fig. 1. Volunteer numbers from 2008-2014

Fig. 2. Volunteers returning to count from 2011-2014

Fig. 3. Volunteers attending workshops once or twice from 2011-2014

Fig. 4. Total number of plants counted by volunteers across 3 sites 2012-2014

References

Tatarenko, I., Dodd, M., Rothero, E., Gowing, D. (2013). Citizen science in meadow studies: population dynamics in *Fritillaria meleagris* on North Meadow (Wiltshire, UK). Research and Conservation of Floodplain Meadows: Proceedings of International workshop, Kaluga, Russia, Moscow Pedagogical State University and the Floodplain Meadow Partnership.

Rothero E., Dodd M., Dyson M., Tatarenko I., Gowing D. Flight of Fritillary: application of Citizen Science in ecology and conservation. P. 66-72, in Moder Problems of Ecology and Human Health. International Conference. Cherepovets State University, 2013

Appendices

Appendix 1 Transcriptions of video interviews carried out by the OU Media team and FMP staff in 2012 at North Meadow

Appendix 2 Notes from workshop year 1

Appendix 3 Summary of volunteer responses to questionnaires

Appendix 4 Feedback figures from questionnaires



Volunteers counting fritillaries at North Meadow, Wiltshire (Mike Dodd)



Volunteers counting fritillaries at Clattinger Farm, Wiltshire (Mike Dodd)



Volunteers counting fritillaries at Lugg Meadows, Herefordshire (Mike Dodd)