



# Opening up vocational pathways into nature-based green jobs

By Neil Smith and Dr Alina Congreve  
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Resources  
FOR CHANGE

Resources for Change Ltd Directors:

D Jones, M King, N Smith, S Sullivan

VAT number: 996 4504 72.

Company Number 7310220.

Registered Address: Cwrt Isaf Farmhouse,  
Llangattock, Crickhowell, Powys NP8 1PH.

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# Executive Summary

To address climate change and restore nature, we will need many more people with ecology skills. Ecologists are needed to create new woodlands, restore peatbogs, reduce flooding with nature-based approaches, and green our towns and cities. Currently, there is a skills crisis in the ecology profession, with employers struggling to fill vacant posts. Recruitment today relies on graduates and postgraduates in ecology and related subjects. One way to address the skills gap is to improve pathways into ecology jobs for young people with vocational qualifications and for mid-career changers. The Covid crisis prompted many people to re-evaluate their career, creating opportunities to bring in new talent from mid-career changers, supported with appropriate training.

We explored recruitment and the skills gap with a wide range of employers: local government; government regulators; private sector consultancies; and environmental NGOs. Our participants came from large, medium sized and smaller organisations, across the UK and Ireland. The workshops revealed a strong consensus on the seriousness and urgency of the skills gap and capacity crisis in the ecology sector. From the employers' perspective, there was frustration that new graduates lacked key ecology and professional skills. There was strong interest from employers to investigate how they could open up ecology jobs to young people with vocational qualifications and mid-career changers.

We also engaged with new entrants into ecology and the barriers they faced starting out. Structural issues identified in the profession included low pay, short-term contracts, irregular working hours, requirements for car ownership, unclear career progression, and insufficient professional development. Most were undertaking substantial unpaid voluntary work, to gain essential skills and experience needed to start their first ecology job. The heavy reliance on this kind of volunteering to develop essential skills is not found in related professions such as Landscape Architecture and Planning. Reliance on volunteering to develop these skills is making a challenging recruitment situation worse, and contributes to the lack of diversity in the sector.

There is a 'perfect storm' in ecology of misaligned supply and demand, with no clear strategy to drive the required changes. We therefore recommend a sector-wide plan to identify current and future skills needs. This should be treated with the same seriousness and urgency as other critical sectors where there is a capacity crisis, such as healthcare. As in healthcare and social care, there is a need to look at staff retention and progression, otherwise new entrants will simply be 'filling a leaking bucket'.



# Key findings

## 1. There is a capacity crisis and skills gap in the ecology sector

The ecology sector faces a significant capacity and skills challenge. Most employers reported serious difficulties in filling vacancies and finding people with the right skills. They thought graduates and postgraduates were missing many of the most important skills ecologists need. In particular, species identification, land management, and practical field skills. Employers also want people with soft skills, who can communicate with non-ecologists.

## 2. An over reliance on volunteering

Entry-level positions often demand essential skills and experience which are not found in most degree and postgraduate programmes. Employers are expecting candidates to gain these through lengthy, unpaid volunteering. Structured training programmes for new entrants into ecology jobs are the exception rather than the norm.

## 3. Jobs in ecology are unappealing compared to other sectors.

Analysis of over 2000 entry level ecology job advertisements highlights the low salaries, temporary contracts, and lack of progression common in the sector. They often require ecology specific certificates to work with protected species and use specialist equipment. A requirement for a driving licence and car ownership is also common. These roles compare poorly with other graduate opportunities, and even non-graduate roles in hospitality and retail. The culture of expecting new entrants to work for passion overlooks the cost of living crisis many wishing to join the profession find themselves in.

## 4. There is confusion about vocational qualifications

There was significant interest from employers in young people from vocational programmes and mid-career switchers entering the profession. Employers were attracted to their practical skills in ecology and well-developed soft skills. A key barrier was inertia in recruitment practices, with most roles requiring a degree by default. The names of the main vocational qualifications meant very little to employers, compared to graduates, where they knew what skills to expect.

## 5. The capacity crisis is unquantified

Despite consensus on the capacity crisis, there is no concrete data to quantify the extent of the current problem. There is also no robust attempt to quantify future demand for ecology skills as we scale-up climate change adaptation. Lacking a coordinated strategy to align education and training with demand, makes it difficult to explain, plan for, or garner wider support.

## 6. The sector is looking for leadership

Our stakeholders looked to Governments and large public sector employers to show leadership. While some current funding opportunities preference green skills and jobs, these are ad-hoc and there is no concrete plan which underpins these individual initiatives.

## Recommendations

### For Governments

- To fund the development of a comprehensive sector-wide plan or 'workforce strategy' to address the skills and capacity challenges in the ecology profession. It should look at current gaps, and the increasing demand for ecology skills in the next 10-15 years due to climate change adaptation. This sector-wide plan should take an evidence-based approach to quantifying the levels of demand for ecological services and the capacity of the education and training system to provide suitably qualified and experienced people. Working strategically, the goal should be to create a plan that allows the sector to confidently address recruitment and retention challenges, quantify workforce needs, and secure support from training and education partners. It will draw attention to the important work of professional ecologists, and garner wider support from employers, education and training providers and other stakeholders in investing time and money.
- Introduce more agile approaches to curriculum review, so that the content of vocational qualifications can adapt with changing technology and employer needs.
- Create greater continuity and certainty in vocational qualifications policy, so that employers can become familiar with the qualifications. This will also give employers confidence that their time is well spent when they invest it giving advice into the development of new, and review of existing vocational qualifications.



- To review and improve the financial models that support the delivery of vocational qualifications in ecology. Apprenticeship courses cannot be cross-subsidised by international students, and income therefore must meet the full costs of the programme. The current financial support for apprenticeships in ecology compares poorly with funding in closely related fields. Bootcamps have been popular with employers in other sectors, but there is a lack of certainty about when future funding windows will open, or medium-term commitment. Greater short and medium-term assurance is needed. Using the apprenticeship levy more flexibly to fund training other than apprenticeships (such as six-month traineeships), as seen through Scotland's Flexible Workforce Development Fund, is an example of the kind of approach which could help the sector meet its skills needs.

### For employers

- Reform recruitment processes and in particular, change the wording in job advertisements to actively encourage applications from people with vocational qualifications, and degrees in other subjects and relevant experience.
- Explore dividing existing job roles to align vocational entrants and mid-career changers with their skills e.g. could ecological surveying and habitat management be carried out by someone from a vocational pathway and the related report writing be done by an ecology graduate.
- Look for opportunities to partner with FE colleges and universities in your region to better align what is taught with the needs of the sector. For example, could you host a site visit and provide the lecturer with case study materials, so students have an opportunity to learn from a recent real project.
- Look for other opportunities to engage current students at FE colleges and universities in your region with ecology careers. This could include attending a careers fair, a careers discussion panel, and sending the careers service details of vacancies.
- Meeting seasonal summer demand for ecologists through more paid work placements supported with appropriate training and mentoring. This aligns the ecology profession with other summer work opportunities open to biology and environmental science students.
- Large environmental regulators should take an active role in the proposed comprehensive sector-wide plan, and other strategic activities. They should allocate time and funding, in the same way as the NHS in England engages strategically in future workforce planning.
- For large employers of ecologists, including environmental regulators, to take responsibility for the professional development of their own staff rather than seeking staff who have developed skills in the voluntary sector and local government. Develop a structured training programme which supports the development of their staff acquiring ecology skills and professional skills. This could be done in partnership with education or training providers. It is disingenuous for an environmental regulator or large consultancy to complain about the lack of ecology capacity in local government if they consistently 'poach' their ecology staff.
- For ecology employers of all sizes, look to partner with CIEEM on the opportunities outlined below. Input is needed to make sure new and revised qualifications are meeting the skills need of the whole sector.

### For CIEEM

- Strengthen partnerships between CIEEM and FE colleges and universities. The aim should be to enhance the alignment of existing courses with the skills needed by ecologists now and in the future. While this report outlines various options for new qualifications, it underscores the value of improving and optimising existing provision. The focus is on making these partnerships work effectively for employers, educational providers, and students, to better meet the demands of the ecology profession. This cannot be achieved alone by CIEEM staff, and needs employers to engage too, in some of the ways outlined above.
- Support the sector in the development of a new Level 4 vocational qualification of 'ecologist technician' funded through the apprenticeship levy. This qualification would be carried out over a two-year period, combining workplace experience and study. It is important to have engagement from a wide range of sizes and types of employers. Without this, there is the risk it will not meet sector needs, and pressure arises to develop an alternative qualification in the near future. Recent successful examples from other sectors have resourced facilitation and administrative support for the qualification working group, to make sure a wide range of employers can readily input. This recommendation is specific to the UK, but the principle of a qualification and technical entry route at this level is also applicable to Ireland.

- In England, support the sector in the development of Skills Bootcamps. These are particularly suitable for individuals with a personal interest or hobby in ecology who aspire to turn that interest into a career. This includes young people passionate about natural history, such as birds and invertebrates, as well as mid-career changers. Skills Bootcamps offer significant flexibility compared to other models, and the content can be readily updated to reflect the latest developments in ecological techniques and technology. Regional implementation allows for adjustments to cater to specific ecological skill requirements in different areas.
- We recommend that CIEEM supports and facilitates the development of accredited certificates in ecology. We note how Cardiff Met has removed barriers to micro-credentials; and the accreditation of training partners by Chester University. These examples of good practice are highly transferable to ecology.
- In Wales, Scotland and Ireland, CIEEM has links with environmental policy makers, but more limited interactions with policy makers in education, skills and training. CIEEM should consider widening its policy work in Wales, Scotland and Ireland to include these decision makers.



# Introduction

This research investigates opportunity for people from vocational career pathways and career changers to help address the capacity crisis in the ecology profession. We review the situation now and look at the potential for that to expand in future. Entry into ecology roles today is overwhelmingly for applicants with subject specific degrees, and increasingly post-graduate qualifications are expected. Working with a wide range of employers, we explore how they perceive entrants from different educational backgrounds including graduates, those who have taken a vocational qualification, and those moving into ecology with a degree in another subject. We look at experiences of education, recruitment and training from both the employers and entrants' perspectives. We also ask questions about what the future looks like for those joining the ecology profession, and the potential for career progression for people entering with vocational qualifications.

Underpinning the work, is a recognition by CIEEM and Lantra that the requirement for a degree acts as a barrier to entering the ecology profession. This applies to entrants without the financial resources to undertake a degree, and those who are not suited to the styles of learning and assessments that characterise degree programmes. The scope of the research encompassed people with vocational qualifications that have existed for many years: HND, HNC, City and Guilds and newer qualifications which contain ecology including T Levels and apprenticeships. We look in this report too, at some of the gaps and where qualifications are missing. Here we will draw on experience from other related sectors, in particular forestry, where a clear suite of vocational qualifications have been developed at different levels with defined opportunities for progression.

Pathways into ecology for career changers, who have a degree but not in a related subject are varied. Ecology is a common hobby and personal interest, if a suitable pathway could be found, people with a hobby or personal interest in ecology could be supported into paid ecology roles. The financial and time commitment creates a large barrier for any mid-career changers considering undertaking an ecology or related degree. There has been a 40% drop in part-time learners on degrees in England between 2010 and 2020. The decline illustrates the retreat of adults from Higher Education<sup>1</sup>. Ireland saw similar falls from 16% participation by mature students to 9%<sup>2</sup>. Automation and increasingly AI are making many existing jobs obsolete, while the enforced disruption of the Covid crisis led to many people re-evaluating their career choices<sup>3</sup>. In 2022, the number of mature students at university in England increased very modestly for the first time since 2009. This growth was mainly inspired by the pandemic, prompting people to start courses in healthcare, but also push factors due to the recession. However, for most mature students, undertaking (another) degree in ecology or a related subject is not a viable option.

The ecology sector itself increasingly discusses the skills gap and capacity crisis. Vacancies are difficult to fill and applicants lack many of the skills needed in the advertised roles. These concerns are usually expressed as an urgent and short-term problem - to fill the roles needed for this summer survey season or the new requirements under Biodiversity Net Gain in England. A working knowledge of field survey techniques, species identification, habitat management, and practical application of conservation law and policy are at the core of many ecology roles. Also important are work-related so called 'soft skills' including working in a team, basic project management, and communicating with non-ecologists. Many employers expect potential entrants to gain these and other skills through volunteering prior to taking a paid role. This central role for volunteering in developing ecology skills essential in the workplace is problematic in a number of ways, which we explore in this research.

The sector is very demanding in the range of skills, knowledge and experience which can be expected of an ecologist. In this study we interpret the work of an ecologist broadly to include the core activities of ecological fieldwork, analysis of the data and report writing. There are increasing expectations for ecologists to be confident with technology including GIS and other tools that support survey work. Ecologists need knowledge of habitat management and the increasingly ambitious programmes for restoration, rewilding and reintroduction. Ecologists are also expected to communicate effectively with non-ecologists including landowners, funders, politicians and the public. These diverse demands are further compounded by the varied habitats, flora and fauna of the UK and Ireland and the availability of skills and experience in these different areas. Meeting local needs in ecology skills may mean for now recruiting people from other parts of the country. Addressing the knowledge and skills gaps more effectively may require customised, regional approaches.

A further factor in the skills gap and capacity crisis is the devolution of environmental policy and increasing divergence across the UK. One example of this is the adoption of Biodiversity Net Gain in England and the DECCA approach in Wales. This places extra demands on ecologists who work across more than one country, and limits work opportunities for those who specialise. Other national and international drivers of demand for ecological services were identified by CIEEM in 2022<sup>4</sup>. This report notes the particularly acute situation in Ireland, but the learning applies to all parts of the UK and Ireland.

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1 Higher Education Student Numbers, House of Commons Library February 2023

2 <https://hea.ie/2021/06/14/study-of-mature-student-participation-in-higher-education/>

3 Aviva - <https://www.aviva.com/newsroom/news-releases/2021/04/number-of-uk-workers-planning-career-changes-as-a-result-of-pandemic-rises/>

4 'Briefing document on the current capacity crisis and the need to provide supports to the professional ecological sector'. CIEEM, 28th February 2022.

Supporting new entrants into ecology roles who have a vocational qualification or degree in another subject could make a meaningful contribution to the capacity crisis in the sector. However, opening up more pathways for entrants does not happen in isolation from the broader picture of how the sector operates. As we were conducting this research, a much more prominent debate played out in the national media about opening up more pathways, including apprenticeships, into the healthcare profession. If structural issues are not addressed that deter people joining who are newly qualified, or those who do join quickly leave, adding more vocational paths is the equivalent of filling a leaking bucket. Our study developed into a deeper examination of the widely recognised capacity crisis in the ecology sector. Economic and social conditions add another layer of complexity as, for example, lower salaries paid for roles in ecology prove insufficient to meet rising housing costs. Ecologists can work in some of our most attractive and more remote landscapes, but where affordable housing options are increasingly limited. One of the very few sectors with a culture of volunteering and low pay, gamekeeping does provide its workforce with highly affordable housing. The situation for ecologists has been exacerbated post-Covid, as organisations have converted housing that was for ecologists and land managers to other commercial uses such as holiday lets. The shift to home working has also pushed up house prices in many previously more affordable areas. Ecologists are often needed to be physically onsite, and some meet or partially meet the requirement to travel widely from their own funds. Ecologists are working day to day with biodiversity and climate crisis, while struggling personally with their own cost of living crisis.

As this report will show, most employers continue to recruit graduates by default, perhaps because that is what they have always done, and because the qualification is well understood and reflects their own educational experience. This is the route that the majority of our participants in workshops followed, and therefore view it as the 'natural' route in. People who now hold senior roles in the ecology profession studied and entered their first ecology job under very different circumstances to today. When they studied, tuition fees were much lower or absent, and paid work was something for a few hours at the weekend to help save for a holiday. Many students today struggle with more than one part-time job and to carve out time to even attend classes. Post-Covid, some have become an essential source of income for their family. Our society has become increasingly unequal, and they compete for jobs with people whose families can support them so they do not need to work during their studies and provide further financial support so they can take up other career enhancing opportunities.

This research is situated in a context where the breadth and depth of challenges could overwhelm the sector as it tries to meet current and future demand. At this point, we remind ourselves that there is a widely held view that current education and training provision is not developing people with the right knowledge, skills and personal qualities to meet the growing challenges. People leaving college and university need to be better prepared with the skills needed now in ecology roles, but also the personal qualities and resilience to enable them to adapt and thrive in an uncertain world. The mounting environmental challenges are in some ways a source of hope for those who care deeply about the environment. They see a vital role which a well-trained, properly supported and valued ecology sector can play in helping to secure a more sustainable future. The science of ecology promotes systems thinking, which is essential to address pressing societal problems. There is now the chance to make a clear and urgent case for a more strategic approach to fulfilling a wide range of interesting and important roles in the ecology sector. The sector holds much of the vision but now needs to mould this into a plan which is 'investible' (quantified, practical and attractive), looking to address short-term problems and long-term requirements.

This report does much to assess the current position, but more needs to be done to anticipate and plan for the needs of the sector in the next five to 20 years as we deal with the challenges ahead. More ecological skills are needed in areas including: natural flood risk management, peatland restoration, woodland creation and the huge task of greening and adapting our urban spaces for climate change. The ecology sector ought to be 'front and centre' in bringing valuable expertise and collaborating with the other professions to adapt our infrastructure, construct our buildings and homes, and manage our green and blue spaces. If the ecology sector does not rise to the challenge, valuable opportunities will be lost and more grey and less green infrastructure will result. Important targets for woodland creation and peatland restoration will be missed. The need for these skills remains, and if the ecology profession does not step up, other related professions including Landscape Architecture, Hydrology and Forestry could move into core ecology roles. Others who work on and manage the land also need to improve their ecological knowledge and skill – farmers, planners and foresters for example – and so the demands will continue to increase. As such, we hope the report will act as a starting point for continued, coordinated dialogue and action on what are urgent and critical issues, with important roles in developing skills and knowledge for CIEEM, Lantra and training and educational organisations.

## The assumptions

The research used two assumptions as a way of identifying and framing the problems facing the sector, to initiate discussion, developing understanding and generating ideas. The starting points for discussion tested the extent to which different stakeholders agreed that:

1. There is a capacity crisis in the ecology sector that is experienced across the UK and Ireland and all parts of the sector, public, private and NGOs?



2. Vocational routes into the sector are a good way in which capacity can be increased, but what skills do we need to provide via vocational routes, and how do these work alongside existing graduate pathways into the profession?

Discussion on assumption one quickly established from participants direct experience that this is a capacity crisis. Discussion on assumption two quickly broadened the scope of the work to examine a number of factors contributing to the capacity crisis, such as poor awareness of careers in the sector and un-competitive employment conditions. The workshops conducted to support this project uncovered openness, active interest and enthusiasm from people for vocational pathways, but this is not currently matched by recruitment practices.

# Research Methods

The research methods consisted of a range of formal and collaborative approaches in order to encourage the sharing of learning and experience amongst the participants. The main elements of the method were:

## Desk research

Desk research was conducted first to inform the topics covered by the workshops, online survey and interviews. The desk study focused on two areas:

The capacity crisis in ecology. The key sources here are a briefing document on the current capacity crisis and the need to provide support to the professional ecological sector, CIEEM 2022. This document focuses on Ireland but the learning is applicable to all parts of the UK and Ireland. In addition, a short CIEEM publication on the main difficulties in gaining employment in the ecology sector (written by an intern)<sup>5</sup>. This looked at some of the specific employment challenges facing ecology graduates and which surface again in this research e.g. temporary contracts.

Policy and applied research about technical and vocational qualifications. The ecology profession has common ground with issues raised across other sectors e.g., challenges for employers engaging with vocational programmes; learners' completion rates; and complex regulatory regimes. The documents identified included policy statements, research and evaluations conducted by government and government agencies, think tanks and charities. These were searched for using Google, Google Scholar, Overton and Policy Commons.

## Workshops

In April and May 2023, we ran seven workshops right across the profession. The 70 participants came from a range of backgrounds, but were mainly people involved in, or with overall responsibility for, recruiting ecologists. Most were practicing ecologists, but some had other backgrounds (forestry, archaeology, landscape) and were involved in managing and recruiting a team which included ecologists. Different sized organisations face their own skills challenges, and we were careful to include smaller, medium sized and larger employers. The workshops were organised by sector, where participants had many concerns in common and divided into: ecological consultancies; NGOs; local authorities and national parks; environmental regulators; and colleges and training providers. Consultancies and NGOS make up a large part of the ecology sector workforce, so we ran the same workshop twice to get good representation from both groups. Training providers have their own challenges and need to recruit staff with up to date skills including GIS, survey techniques, and conservation law and policy, to be able to train others. The training providers workshop was the most diverse and included small ecology companies that deliver training; Further Education colleges; universities that deliver vocational courses; charities such as the Field Studies Council and Royal Horticultural Society; and CIEEM's own training team.

The workshops were designed to draw out attitudes to recruiting graduates and vocationally qualified people and the perceived strengths and weaknesses of graduates and those with vocational qualifications. We used a recruitment 'game' which we called the dream team to open up a discussion about people with different qualifications and experience. This facilitated discussion, avoiding the tensions that can result from asking people directly about members of their team. It also addressed how skills are developed through training, structured courses and volunteering. It concluded with a discussion about what needs to be done, by employers, by governments and the role CIEEM and Lantra should play in supporting the sector.

## Online survey

An online survey was used to gain a complementary perspective from new and recent entrants to the profession. This was run using the Smart Survey platform and was live from 16th May- 13th June 2023. Before launching, it was tested by two recent graduates in ecology working on placement at R4C and one person studying a BTEC in Countryside and Environmental Management. The survey was adjusted following their feedback to improve clarity. Carrying out the survey after the workshop meant we could ask respondents about the specific skills that employers thought were most important. The survey was promoted in a number of ways including:

- Articles in CIEEM e-news and Lantra Network newsletter
- Social media posts on the CIEEM LinkedIn (35,547 followers), Twitter (9723), and Facebook (3400)
- Social media posts on LinkedIn groups e.g., Biodiversity Professionals

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<sup>5</sup> 'What are the main difficulties in gaining employment in the ecology sector', <https://cieem.net/wp-content/uploads/2021/02/Anouska-Internship-report.pdf>



- Direct email requests to the CIEEM Academia Special Interest Group (SIG) for members to share it with recent graduates through their alumni LinkedIn and Facebook groups
- Direct request to tutors of CIEEM accredited programmes to share it with recent graduates through alumni LinkedIn and Facebook groups
- Direct mail-out to all Lantra stakeholders
- Direct request to all our workshop participants to share with their professional network
- Social media posts from the British Ecological Society (BES) account
- Social media post from LANTRA account
- Direct messaging on LinkedIn using the filters: UK and Ireland; ecology, ecologist, conservation, countryside; and the titles of common vocational qualifications.

The survey was then manually cleaned to remove responses from ecologists who do not work in the UK or Ireland and a significant number of responses from 'bots'. Once cleaned the survey received 138 responses. These 138 were almost entirely complete, with respondents giving considered answers to all of the questions and taking time to add additional comments in the free text boxes.

The survey covered the following main topics:

- Experiences of education; what were the most useful things they learned on their course and what they wish they had learned more about.
- What they think are the best ways of learning to prepare for the workplace.
- How confident they are with the skills employers in our workshops thought were most important.
- Whether they gained these skills from their college/university course, short courses or volunteering.
- Their experiences of applying for ecology jobs, including the role of short courses and volunteering in securing an ecology role.
- What they think are the main skills gaps they have now, how they would like these addressed through training, the barriers they have in meeting these training needs, and how their training priorities differ from their employer's priorities.

The survey gathered responses from four types of new or recent entrant, those with:

- A degree or master's degree in environmental science, ecology, geography or similar, providing 77% of the total responses.
- A degree in another subject not related to ecology and the environment, providing 8% of the total responses.
- A vocational qualification in the environment, countryside, ecology or similar, providing 7% of the total responses.
- People without a degree in any subject or an environment related vocational qualification who have gained experience in other ways such as voluntary work or short courses, providing 9% of the total responses.

We did also ask if our survey respondents who had a degree had also completed a vocational qualification, and this did not apply. We did in our workshop participants have a small number of participants who had undertaken vocational qualifications as a pathway into their degree, or completed a vocational qualification subsequently.

## Job advertisement analysis

We conducted an analysis of 2,162 entry-level job adverts from 7,000+ ecology-related job adverts posted from June 2021 to June 2023, kindly provided in an anonymised format by Environment Job. The adverts were shared as a spreadsheet and included the following fields: job title, job role description, hours (full or part time), level (entry, mid or senior level), contract type (permanent, fixed term, temporary), region (e.g., Wales, South East), primary sector, secondary sector, salary and location (town, city and / or area). The job adverts covered all of the UK, but with more limited coverage in Ireland. The data provided by Environment Job averages 290 posts per month.

The jobs were filtered to select the entry level jobs across all parts of the ecology sector, with 83% of them for roles in England. Although the proportion of jobs was broadly in relation to the populations of England, Scotland and Wales, only 1% of the jobs were for Ireland (Northern and the Republic of Ireland). The roles advertised were across the profession and included private consultancies, local authorities, national and local NGOs, regulators, national parks, regulators and agencies.

The analysis looked at the proportion of full and part-time roles, employment status, country, primary sector and salary levels, first in aggregate and then by country. The sample sizes per country were 1,797 for England, 218 for Scotland, 125 for Wales and just 30 for Ireland, and so the findings for each country can be treated with reasonable confidence except when considering Ireland. It is likely the Environment Job website does not represent the scale of the Irish ecology sector, and there are other preferred places for advertising posts in Ireland. At the time of writing (July 2023) 'greenjobs.ie' currently shows 10 posts<sup>6</sup> and CIEEM job board lists one vacancy. The more common site to post vacancies in Ireland is [www.ecocareers.ie](http://www.ecocareers.ie). CIEEM's Irish membership was stated at 314 in February 2022<sup>7</sup> and LinkedIn lists 796 people in Ireland who describe themselves as an ecologist, suggesting there are other ways ecologists in Ireland are recruited.

## Interviews

Stakeholder interviews were held with 10 ecology and conservation professionals from across the sector and the UK and Ireland. These were experienced professionals with an overview of sector issues beyond their specific role. These people were put forward by CIEEM and Lantra. The roles of the interviewee's varied from chief executives, directors and estate managers to principal ecologists. Not all were ecologists by profession, but all were approached because they had perspectives on managing teams of ecologists including recruitment and skills development of ecologists. Overall, we looked for diverse perspectives, positions and people with insights beyond their own organisation. These interviews provided an opportunity to: address the problems facing the sector in more detail; sharing and testing the main learning points from the workshops; examining current recruitment and training practices across the sector; and discussing wider sector recruitment, training and retention problems.

In addition, 13 further interviews were conducted with people who had experience in technical and vocational qualifications including: Department for Education; the Institute for Apprenticeships and Technical Education (IfATE; the gatekeeper for new vocational qualifications); Universities UK (the sector body representing the interests of higher education in the UK); a subject specialist who advises two large accreditation bodies on their environment and countryside vocational qualifications; British Ecological Society; a university researcher specialising in vocational qualifications; a researcher at a think tank with expertise in vocational qualifications; a university lecturer in ecology with expertise in authentic learning; two further educational college lecturers identified for leading practice in their ecology programmes; and a senior representative from the forestry sector heading up their vocational programme development.

Several short interviews were done with new and recent entrants to the civil engineering sector as a counterpoint to the experience of new and recent entrants to the ecology profession, alongside whom they often work.

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6 <https://www.greenjobs.ie/browse-jobs/ecology-jobs/>

7 <https://cieem.net/wp-content/uploads/2022/08/Current-capacity-crisis-in-the-ecological-sector-CIEEM-Briefing-Paper-Final-1.pdf>

# 1.1 Setting out the scope of the capacity crisis from our desk study

In setting out the capacity problems in the ecology sector, we looked for documented evidence of the specific problems organisations have in recruiting enough people into ecology roles, and those with the right skills and experience. There was little published information available, and so much of the evidence for the 'capacity crisis' was based on anecdotal information from CIEEM and Lantra in commissioning this report, and during our research from the workshop participants and from the interviewees. This is presented in section 1.2 below, and is woven throughout the Report. In this section, we can summarise the published information that we were able to identify.

In February 2022, CIEEM published a 'Briefing document on the current capacity crisis and the need to provide support (sic) to the professional ecological sector'. The briefing paper was written to raise awareness of the capacity crisis and its production was led by the CIEEM team and members in Ireland. The paper examined the current and future issues the sector faces as a result of the capacity shortage and made suggestions for capacity building in the sector. Whilst much of the paper focuses on the situation in Ireland, it makes references to aspects of the problem which affect all parts of the UK and Ireland.

The briefing paper reinforces our assessment of the drivers which are increasing demand for ecological services expertise including:

- action to reduce greenhouse gas emissions related to capturing more atmospheric carbon through tree planting and peat bog protection and restoration - 80 depleted (cutaway) peat bogs in Ireland alone.
- increased biodiversity / Biodiversity Net Gain requirements.
- increased demand for ecological expertise in the public sector and local government.
- changes to the National Planning Framework in Ireland which will require a range of new water management plans and solutions.
- the gap between policy goals and sector capacity in the National Parks and Wildlife Service in Ireland.
- specific to Ireland are EU drivers including the Water Framework Directive and the EU Biodiversity Strategy, although much EU policy in place at the time of our departure still survives in legislation in England, Wales and Scotland post-Brexit.

## Recruitment problems

Helpfully, the paper begins to quantify the recruitment challenge which a small sample of private consultancies in Ireland faced in 'filling positions in the sector'.

*"All of our respondents had advertised job vacancies in the last two years. Over 80% of these could not fill all of the vacancies they advertised, with 50% having 7+ positions still vacant in their company. All but one respondent said they have had to turn down work opportunities due to an inability to fill ecological vacancies."*

Further indications of the scale of the problem were provided by feedback from online recruitment sites:

*"In 2021 there was a 30% increase in jobs posted on [www.ecocareers.ie](http://www.ecocareers.ie) versus 2019".*

*"A number of employers have taken the option to extend their advert and reported that this was due to difficulty in filling the position."*

*"[employers]... are returning to re-advertise as their original candidate accepted a different offer. So certainly, it sounds like employers are trying harder to secure candidates."*

There may also be intensified competition for candidates with '50% of consultancy survey respondents saying they lost staff to public sector positions'. The paper reports that Heritage Officers agree that demand for 'ecological knowledge' will grow in future.



## Skills gaps

The paper highlights the problems with the skills that graduates leave university with. This has common features with the findings for this report (our emphasis in bold):

*“The lack of necessary knowledge and skill of new entrants was also highlighted. There are a number of university courses in ecology, but most focus on academic knowledge rather than practical field skills. Multiple respondents highlighted a **‘considerable gap in the graduates coming from the various universities in relation to practical field survey techniques and ID skills in particular’.**”*

The paper goes on to highlight the challenges which the Irish Government has in fulfilling ecological tenders, with low levels of response (private consultancies also reported being unable to tender for work because of a lack of capacity) and insufficient skills:

*“There is generally a significant lack of knowledge and experience relevant to the advertised post.”*

One interview for this study with an Irish consultancy reinforced the likely increase in demand in Ireland:

*“To some extent, we’re playing catch-up with the rest of the EU, with new policies and priorities increasing demand, but not enough capacity in the education system to provide the people we need.” (Private sector consultancy)*

Against the backdrop of insufficient supply to meet current and expected demand, the paper called for ‘support to develop the profession’ in Ireland:

- Improved awareness of the sector and the career opportunities.
- Changes to the curriculum for training ecologists so that they can work effectively in the field.
- More opportunities to gain experience e.g., placements and volunteering opportunities.

In the view of the paper’s authors, there is an over-reliance on courses ‘in Britain’ and ‘British training courses are often suboptimal given the difference in policy between Ireland and Britain.’

The paper suggests a range of actions, which resonate with thinking in the rest of the UK and Ireland on what could be done, summarised here as:

1. A biodiversity capacity review so that a well-informed action plan can be developed.
2. Closer working with colleges and universities, especially to address the lack of graduates with practical skills, addressing identified shortage areas.
3. Internships, paid.
4. Placements with companies whilst studying.
5. More in-house training.
6. Innovation in course provision – a part-time masters degree for people transferring to the profession.

They also recognise a role for apprenticeships and intensive training courses, as well as developing technological solutions to ‘improve working conditions for ecologists’ to reduce the need for ‘unsocial nocturnal work’.

## The CIEEM Perspective

In November 2021, the then CIEEM president, Max Wade, and the president-elect, Richard Handley, published an online article<sup>8</sup> called ‘A Crisis in our Sector’ which asserted that the ecology and environmental management employment sector is approaching a critical point. The introduction highlights the following main points:

- A shortage of applicants for jobs, especially at senior levels.

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8 <https://cieem.net/a-crisis-in-our-sector/>

- Pressure on the health and wellbeing of those who are employed in the sector.
- Severe delays to the delivery of important nature recovery initiatives and the development of critical infrastructure.

The article goes on to identify the critical juncture at which the current position took root - the financial crash of 2008. The upheaval this brought should alert the sector to the yet-to-be felt impacts which might flow from the pandemic. The immediate effects of pandemic-related delays were being felt through 'unacceptably heavy workloads, staff shortages and tight deadlines'. These are combining, they state, to undermine the health and wellbeing of ecologists.

In this context, it is not surprising that CIEEM identifies a problem with recruitment and retention as 'people voting with their feet' as they struggle with 'working conditions which are unacceptable and unsustainable'. They further highlight that the sector is, in effect, eating itself as people move around to take better paid roles, with employers desperate to secure the skilled capacity they need.

They conclude with the statement that 'doing nothing is not an option' and that CIEEM, as a professional body, has an important role to play in protecting the health and wellbeing of the ecology sector. Further:

*"(We want to) create a more diverse and inclusive profession that people from all backgrounds want to be part of and ensure the best outcomes for biodiversity and society from the work that we do. A Green Recovery, achieving net zero and transition to a nature positive economy are dependent on **a talented and valued environmental workforce able to do their best work, providing the advice, taking the decisions and making the innovations that society needs.**" (authors' bold emphasis)*

CIEEM asserts that it is not their role to 'find and implement solutions to workforce shortages', but in this report we argue that the capacity crisis is indivisible from the goal of improving 'the welfare and inclusivity of the profession'. CIEEM has a trusted role as a convenor, bringing the parties around the table who can together take forward solutions. Other professional bodies in related fields are proactive in addressing their capacity crisis including Forestry and Landscape Architecture<sup>9</sup>. This report is testament to this reality - waiting for governments, universities, training organisations and individual employers to address the 'capacity crisis' on their own is now also, not an option.

## Perspectives from other commentators

The impact of a skills gap or capacity crisis has been addressed by other commentators and organisations. In England, the debate has often been framed around the immediate requirements for expertise associated with Biodiversity Net Gain. An article in Environment Analyst<sup>10</sup>, is representative of this coverage, asserting that 'mandatory BNG requirements in English planning will lead to a huge call for consultants, with firms already struggling to meet demand.' The article quotes Steve Jackson-Matthews of landscape consultancy LUC who believes that 'consultancies have found it increasingly difficult to recruit ecologists since the pandemic':

*"Lots of local authorities are already expecting us to deliver BNG. It's making existing projects more complex and therefore more time consuming. It means that we are working more closely with other disciplines such as GIS teams and landscape designers, earlier in projects... There are lots of bodies employing them (ecologists) now, including councils, energy companies, landowners and developers, so it's not just us. We're competing in a large group.*

Publications aimed at a local government audience have also focused in on the need for ecology skills due to the introduction of Biodiversity Net Gain. An article for Localgov.co.uk by William Eichler from August 2021<sup>11</sup> highlights a shortage of 'in-house' ecologists in local authorities with "only one third of planning authorities in England having access to their own 'in-house' ecologist." The implication of this is that local authorities will be forced to bring in consultancy support, adding further pressure on the sector.

*"In order to support local government in its role of leading places and providing a greener future, Government needs to work with councils and business to establish a national framework for addressing the climate emergency, including tackling biodiversity loss," said Cllr David Renard, environment spokesperson for the LGA."*

9 <https://www.landscapeinstitute.org/publication/skills-for-greener-places-a-review-of-the-uks-landscape-workforce/>

10 <https://environment-analyst.com/uk/109160/bng-set-to-worsen-skills-gap-crisis-in-ecology>

11 <https://www.localgov.co.uk/Only-one-third-of-planning-authorities-have-access-to-in-house-ecologist/52768>

A letter from the Defra Permanent Secretary dated December 2021<sup>12</sup> includes a table of ‘mitigating actions’. In relation to ecologists and ‘Thriving plants and wildlife’, the letter stated:

*“For mandatory biodiversity net gain this is likely to involve funding for LPAs (Local Planning Authorities) to increase ecologist capacity and upskill current ecologist resource.”*

Despite all the discussions about skills as the Biodiversity Net Gain policy has been piloted and developed, over 60% of local authority planners in England still report having no in-house ecological expertise<sup>13</sup>. Concern about skills has not translated into action on the ground at the speed and scale required.

Few academic researchers have looked at the skills gap among ecology students or ecologists. An exception is a focused study looking at people early in their career and their views on the quantitative and statistical teaching they experienced during their biology/ecology degree.<sup>14</sup> Their sample included over 900 participants working in the UK, Ireland, other parts of Europe and also North America.

*“We found a clear self-perceived lack of quantitative training: 75% were not satisfied with their understanding of mathematical models; 75% felt that the level of mathematics was “too low” in their ecology classes; 90% wanted more mathematics classes for ecologists; and 95% more statistics classes.”*

Their survey also identifies an interest amongst ecologists in learning more about coding in relation to data analysis. This is a common theme with the survey in this report, where our respondents found the statistical content on their courses valuable, including the use of open source software – R. As we shall see later, there was also demand for more advanced and robust statistical education for ecologists, and for it to be delivered in a way that could be more readily absorbed.

More widely, the Environmental Audit Committee’s green jobs report<sup>15</sup> published in October 2021 highlighted “skills gaps” across crucial sectors, and predicted ‘the UK will not hit long-term goals on the environment and climate without further investment in training programmes. Areas such as land management and species conservation have the most urgent needs’. Specifically in relation to restoring nature, the Report recommended that:

*“Defra’s Skills Gap Plan covers all areas of the 25 Year Environment Plan and is accompanied by an Action Plan to address skills shortages, developed in coordination with the Department for Education and stakeholders. The Skills Gap Plan and Action Plan ought to be published by March 2022 at the latest and aligned with Defra’s existing and forthcoming sectoral plans and strategies, such as the Waste and Resources, Clean Air, Trees, Peat and Nature strategies.”*

Furthermore:

*“Currently, neither the 25-year Environment Plan nor any plans and strategies released under the Plan include an assessment of skills gaps and how these might affect environmental aims.” EAC Green Jobs Report*

The Royal Society for the Protection of Birds (RSPB) are among a number of NGOs who are critical of the lack of progress in developing ecological skills, stating in a warning about the UK workforce: <sup>16</sup>

*“does not, and is not on track to, have the skills and capacity needed to deliver the green jobs required to meet its net zero target and other environmental ambitions”.*

The RSPB further notes that ‘some of the gaps highlighted included a lack of training among farmers and landowners with regards to environmentally friendly land management and a **“severe skills shortage in ecologists”** (authors’ emphasis) on boosting animal and plant life’.

12 <https://committees.parliament.uk/publications/8490/documents/85883/default/>

13 <https://www.rtpi.org.uk/news/2023/september/biodiversity-net-gain-delay-welcomed-but-details-resources-and-training-for-planning-teams-still-needed/>

14 Barraquand F, Ezard THG, Jørgensen PS, Zimmerman N, Chamberlain S, Salguero-Gómez R, Curran TJ, Poisot T. 2014. Lack of quantitative training among early-career ecologists: a survey of the problem and potential solutions. PeerJ 2:e285 <https://doi.org/10.7717/peerj.285>

15 <https://publications.parliament.uk/pa/cm5802/cmselect/cmenvaud/75/7502.htm>

16 <https://www.bigissue.com/news/environment/severe-skills-shortage-threatens-uks-long-term-environment-goals/>



The 2023 review of the Environmental Improvement Plan for England<sup>17</sup> review makes no reference to ecologists or ecological skills, other than in relation to forestry and timber supply. Later in this report we showcase the Forestry sector. The professional body has advocated successfully for significant additional funds through the 25-year Environment Plan, to address that sector's capacity crisis. For the Forestry sector, this has provided a valuable alternative route to bring in further funding for the skills needed in nature based green jobs.

## Ireland

In Ireland, ecology has also struggled to break through into more mainstream debate about the skills needed to move to a green economy and society. The National Skills Council report 'Skills for Zero Carbon'<sup>18</sup> is written to support the targets set out in Ireland's Climate Action Plan. Ecology and conservation are hardly mentioned, and given only a few lines in the 180 page report. For conservation professionals, the report estimates there are currently around 600 in Ireland, taking a narrow definition of the role:

*"Conservation professionals are responsible for ensuring that landscapes, habitats and species are protected and enhanced via appropriate management and conservation. They promote public understanding and awareness of the natural environment and help to develop and implement appropriate policies to achieve these objectives."*

A specialist ecologist meanwhile is framed as an emerging or niche occupation whose role is to support renewable energy:

*"Highly-specialised ecological and environmental professionals, who are involved in the planning and EIA stages of (mainly) wind developments. They carryout surveys, monitoring, and impact assessments to predict the likely impact of developments on species and habitats. Specific subject areas of demand include: Ornithology Marine biology / ecosystems."*

Both of these occupations are presented as roles for graduates supplemented by specialist postgraduate study.

## Wales

In Wales the Net Zero Skills Action Plan (Stronger, fairer, greener Wales), is a more process focused document, rather than organised by sector. The next stage in the process in Wales is to "undertake a public consultation on sector specific skills requirements before publishing a skills roadmap." This information will then be used to:

*"Develop a Journey to Competence (progression pathways to demonstrate career options) for each occupation and for new and transitioning jobs in each sector, working with industry and partner organisations. The pathways will outline what qualifications are needed throughout the progression journey to become competent in an occupation."*

There is no indication that ecology will be a sector that has a skills road map, and there is no mention of ecology and conservation anywhere in the document. There are illustrative case studies throughout the document, none of which relate directly to ecology. The think tank Wales Centre for Public Policy<sup>19</sup>, in a review of Net Zero Skills in Wales notes the importance of forestry skills:

*"Policy initiatives to increase afforestation and restore biodiversity mean that employment in this sector will grow as the net zero transition advances. In forestry, this will not involve a wholesale change in the skills needed, but a limited pipeline of trained workers and competition between the public and private sectors means that there could be a shortage of skilled workers. Accredited on the job training could address some of these issues."*

Their view of ecology skills is at odds with the findings from our workshops presented in this Report, where the view from participants from Wales is that this is a skills and capacity crisis.

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17 <https://www.gov.uk/government/publications/environmental-improvement-plan/environmental-improvement-plan-2023-executive-summary>

18 <https://enterprise.gov.ie/en/publications/skills-for-zero-carbon.html>

19 <https://www.wcpp.org.uk/wp-content/uploads/2023/02/Net-zero-skills-insights-and-evidence-from-emissions-sectors-in-Wales-Policy-Briefing-.pdf>

*"For nature-based jobs, there is a good supply of graduates with the required skills, but limited specific accreditation schemes, particularly for nature restoration and peatlands. Apprenticeships and training courses could help to increase numbers of skilled workers although businesses may be reluctant to invest in training if they think workers might change jobs on completing the programme."*

It has been left to the environmental NGO sector in Wales to put the case for nature based green jobs<sup>20</sup>. A report by the RPSB tries to quantify the number of people needed including: restoring and creating priority habitats; environmental land management advice; in urban green spaces; planting woodlands to assist net zero targets; controlling invasive species; nature based tourism; and biodiversity gain for public bodies (Section 6 responsibilities). It estimates the need for 7000 additional roles, and represents a promising starting point for a comprehensive, sector plan. It ends with an observation about skills, but does not have the opportunity to develop the training and delivery model further. The report came out in November 2020, and it is interesting that none of our workshop participants from Wales or interviewees based in Wales were familiar with it, suggesting that during the Covid crisis, it struggled to gain traction. In both Wales and Ireland, ecology appears to have been sidelined, as decision makers focus on other green skills for renewable energy, transport and retrofitting buildings.

## Scotland

In Scotland there has been significant activity on green jobs, but this work appears siloed and often disconnected. Skills Development Scotland, the public body responsible for skills planning and apprenticeships, commissioned Warwick University to undertake an analysis of Green Jobs in Scotland<sup>21</sup>. It takes a labour market approach, separating: where there is a need for existing workers to develop new skills; growth areas where there is increasing demand for existing occupations; and totally new occupations (giving the example of a solar systems technician who can install technology and also advise on how it can best be used on a specific site). A key recommendation is using web-scraped job vacancy data to better understand the demands for green jobs and skills. In common with Ireland and Wales, there is no direct mention of ecology skills or nature based green jobs.

The Commission for the Land-based Learning Review was set up to review learning in Scotland's land-based sectors. It includes biodiversity, environmental conservation, peatland restoration, game and wildlife, and forestry. It also includes other large sectors of food and drink processing and agriculture, but excluded nature-based tourism and recreation. It also covers from early years and school, through college and university to lifelong learning. There are interesting observations for this study, that:

*"businesses ...have little time to grapple with the intricacies of funding rules and requirements, whilst the supporting education, training and career options ('pathways'), can be a confusing mixture of acronyms, course details and choices... Many of (the existing qualifications) have become outdated, do not fully reflect modern industry needs and often have a low uptake. Over time there has been a reduction in the delivery of some of the more expensive practical programmes and access for learners has significant regional variation."*

In having such a broad scope of educational levels and professions, it cannot offer the ecology sector the focus it needs to address its capacity crisis.

NatureScot produced a research report – An initial assessment of Nature Based jobs and skills<sup>22</sup>. It attempts to quantify the numbers already employed in the sector, but finds this challenging for ecology and other related professions due to the way labour market data is collected. It then engages with stakeholders to look at future prospects and associated skills issues for: peatland restoration; woodland restoration; invasive species management; the marine environment; planning; and forestry. There are few sectors where the report was able to attach numbers or even clear trends with any confidence, exceptions being forestry and peatland restoration. Those were also the fields most clearly able to articulate their specific skills gaps. Also of interest, the report notes the stiff competition for the same skills coming from civil engineering. It also observes:

*"Graduate skills that are in demand from other sectors such as software development, digital processes and data analytics were (difficult to fill). These jobs roles are relative rare currently, but many see them as vital to the future development of remote sensing and application of data to more efficient and effective land management practices."*

20 <https://www.natureservice.wales/wp-content/uploads/2023/01/RSPBCymruEstimatingtheScaleReportNovember2020ENG1.pdf>

21 <https://www.skillsdevelopmentscotland.co.uk/media/49853/green-jobs-in-scotland-executive-summary-2.pdf>

22 <https://www.nature.scot/sites/default/files/2020-12/Publication%202020%20-%20NatureScot%20Research%20Report%201257%20>

# 1.2 Findings in relation to the capacity crisis and skills gap

## 1.2.1 Introducing the capacity crisis and skills gap

The assumption of a capacity crisis in the ecology sector and a critical skills gap was strongly supported across all the workshops and in the stakeholder interviews. Later in this section, we also explore the skills gap from the perspective of ecologists entering the profession.

Finding enough people with the right skills and experience is a problem across all parts of the sector and all parts of the UK and Ireland. Despite this widespread concern, no-one in the ecology sector we engaged with was able to quantify the crisis e.g., 'we need 150 more ecologists in England who can work on Biodiversity Net Gain' or 'we need 120 more specialists in peatland restoration in this region'. None were familiar with the attempts in Scotland and Wales discussed above to begin quantification. An interviewee with a strategic role in education contrasted the ecology profession with other sectors:

*"We have been continually helped in health and social care by the large Government type organisations like the NHS that do actually 20 years skills framework documents forward, and actually DHSC is doing one in social care at the moment. So if I was thinking about this sector, where is Defra? On defining a skills framework? Or where are they saying that the future jobs will be? What are they doing with employers? And with some future gazing to say, here's where our skills are going to need to be in the future? How do we go from here to there? ....If you're looking at providers (universities and FE colleges) they're also in the short-term around what are they going to be delivering next year? How will they get learners in to do it, whatever type of learning - vocational or academic. So somebody needs to take a slightly longer-term view and to work with employers to corral them around?"*

The feedback from workshop participants and interviewees was based on their own experiences and those in their professional circle. However, the existence of a capacity crisis in the ecology sector was consistent and strongly supported across all the workshops and interviews. As the literature review above shows, CIEEM and other parts of the sector firmly believe there is a substantial problem with wide-ranging effects.

The pressures from new policy measures were at the forefront for local government participants in England, illustrated by this environment professional who manages a multidisciplinary team including ecologists:

*"I'm doing a lot of work with external contacts, trying to talk about BNG (Biodiversity Net Gain). And you know, what it would mean for landowners and why they might be interested in it and how it would affect developers. I'm not an ecologist and often need an ecologist with me to talk about some of the technical aspects, it's really important to have somebody there who can talk about ecology and relate it to other people."*

As this example shows, this skills gap is complex, and includes technical knowledge about the new legislation, experience in ecology and habitat management, and being able to communicate effectively with stakeholders. The discussion of skills below will be of interest to those involved in the management, recruitment and professional development of ecologists. The detail will be of particular interest to people with responsibility for the professional development, education and training of ecologists.

## 1.2.2 Exploring the skills gap through our workshops

To help break down that complexity and understand what the skills gap is, we asked participants to discuss the skills of graduates and those from vocational pathways. Graduates in ecology and related subjects make up most new entrants into the profession. We asked about the skills they already have, and what skills graduates are missing and need to develop. We asked the same questions about vocational entrants, the skills they already have and that they needed to develop. Participants added their thoughts to a virtual whiteboard, an example, from one of the seven workshops is show in Figure 1 below.



Figure 1 Example of our virtual whiteboard activity about the skills gap

## Recent graduates

### Skills they already have

- good foundation in theory and survey methods
- Project management (beginner-level)
- good understanding of environmental law and policy
- Often have GIS & research experience
- Knowledge of latest developments in discipline

### Skills they need to develop

- Experience working in/with planning system
- basic practical skills in land management
- Land management and understanding of farm businesses
- practical applications of the theory into real world projects/jobs
- Experience working within constraints (low-capacity, budgets, regulations, etc.)
- Working with non-ecologists (people/team working skills)
- grant funding experience
- procurement, budgets, etc.
- real world experience balancing multi disciplinary
- practical skills for land management- e.g. chainsaw, brush cutter, tractor etc

## Vocational career pathways

### Skills they already have

- good practical experience. Certificates for Chainsaw/Spraying/brushcutters etc
- Good grounding of the use of land management techniques
- Good idea of how 'real world' works (short-staffed teams, etc.)
- experience working with volunteers or as volunteers
- Better interpersonal skills with land managers & contractors
- Good chance this could be a second career, in which case they could bring a wealth of experiences and skills from a range of sectors
- Good level of practical and real world experience
- species id

### Skills they need to develop

- Strong Systemic/theoretical ecological knowledge
- political awareness
- Project management, budgeting & financial processes
- may lack some of the theoretical knowledge
- grant funding experience
- If young and/or first job, they may need support in basic workplace practices/responsibilities.

To analyse the results and generate overall themes from the virtual whiteboards, we took the key terms that emerged from the survey of recent entrants - the three things they found most useful on their course and the three things they wished they had learned more about. We added to that, additional terms that emerged in the workshops, but were not notable in the survey.

Overall, the workshop participants were very positive about the skills and experience that people who have taken a vocational qualification already have. Figure 2 below shows the 10 most prominent terms from the seven workshops.

**Figure 2 Skills vocational entrants have from employers' perspective**



People who followed a vocational qualification were regarded as having well-developed ecology skills, in particular practical field experience (mentioned 14 times) and species identification (mentioned 7 times). Participants also commented positively about the range of 'soft' skills that vocational entrants had developed. There was a view across all of the workshops that vocational entrants had better people skills. Some elaborated on this, raising specific points including: good working relationships with colleagues; working with volunteers; relationships with land managers and contractors; and stakeholder engagement. One of the consultancies participants, who had two new entrants contrasted their approaches to work:

*"People from a vocational background have a lot more rounded, non-technical skills. And it means that they're a lot easier to fit into a team, because often they are a lot more self-motivated, more organised. We have two guys on our team, one guy, he's very much task orientated, give him a task to do and he does it, then he sits and waits for somebody else to give another one. The other one 'I've got nothing to do, what can I do?' 'I've done this because I had some spare time', and you very much see a different application."*

As well as working well in a team, vocational entrants also had skills in managing a team, managing volunteers, delegating tasks in a team, and having leadership skills applicable to their career stage. From their work and varied assessments, they also had opportunities to develop good public speaking skills and communicating with the media. All these skills had been developed in a real-world context. This gave them good time management skills, the ability to work to a deadline and they were familiar with 'working at pace'. The term 'real world' was used in several different senses and could mean applying knowledge from their studies to the real world and making things happen in the real world.

We also discussed some of the skills that vocational entrants would need to develop. Figure 3 below shows the 10 most prominent terms from the seven workshops.

**Figure 3 Skills Vocational entrants need to develop from employers' perspective**



Report writing was the key skill that people from vocational pathways lacked, mentioned seven times. Some elaborated by mentioning specific reports including PEA (Preliminary Ecological Appraisal) and EclA (Ecological Impact Assessment). They may be less aware than graduates where to find key data that goes into a report. Other participants commented on the analysis of ecological data and interpretation skills that are needed in a report to justify the recommendations. In the training providers discussion, this was framed in the context of the rise of the Internet:

*"It's really critically important to be able to fact check and assess what you're doing. And I think that that is something that we're really dealing with at the moment, that with the Internet being such a wide and varied place, that there is an absolutely key requirements for this skill to actually assess the information."*

The other key difference to graduates is a lack of foundations in ecology and knowledge of ecological systems. They may not understand the ecological principles behind some of the habitat management approaches they are using. If most of their experience has been developed in a particular context e.g., a woodland or grasslands in one part of the country, they may struggle to transfer that knowledge to another context.

Vocational entrants may not have an overall framework on which to 'peg' individual pieces of knowledge. In the workshop discussion, there was some concern that skills developed in a vocational context could be too specific. A participant in the consultancies workshop gave an example where the person she worked with was highly competent in work related to bats but could not tell what tree the bats were in as they lacked any plant ID skills. Another participant elaborated using the example of eDNA, which is now used in ecological surveys for Great Crested Newts. Her work colleague who had followed a vocational path was not clear on exactly what DNA was, so had no framework to attach the eDNA surveys knowledge to.

Other points mentioned less frequently included IT skills and use of specialist ecological software and GIS packages. In common with graduates, there was a lack of experience in finance management, project management and budgeting. While there was a general view that people who followed a vocational pathway had strong interpersonal skills, not everyone is the same. Some may have a passion for a particular aspect of ecology such as birds or invertebrates, but struggle to communicate the relevance to non-ecologists. Some people on vocational qualifications are very early in their career, including on the new T Levels and still 16 and 17 years old. Due to their age, they may lack the communication skills and people skills found in their slightly older counterparts.

Graduates make up most new entrants into the ecology profession, so we discussed the skills that they have alongside the skills of vocational entrants. Figure 4 below shows the 10 most prominent skills that graduates already have, identified from the seven workshops.

Figure 4 Skills graduates have from the perspective of employers'



The most prominent skill that graduates already have is report writing, mentioned 14 times. Some elaborated on this by noting the stages that go into report writing including desk research skills, locating information, and using and sourcing references. Connected to this is a strong set of skills in data analysis mentioned eight times and research skill mentioned seven times. This meant graduates were able to use ecological evidence as the basis for decision making in their reports. In contrast to vocational entrants, they had strong foundations in ecology and knowledge about ecological systems. In the discussion, one of the ecologists working for a training provider described it as 'thinking like a scientist'. IT skills were mentioned briefly in the notes but more in the discussions. What was meant by IT skills was a working knowledge of Office software, with one training provider commenting:

*"I think it's using Word, Excel and things like that, because I had people that can't do that. And just think, how can you write a report, how you're going to do what we need to do, if they can't use the basic packages."*

Graduates gained confidence using IT during their degrees, and as a participant in the consultancies workshop commented:

*"When I did my degree, my level of IT skills went right up, because they did focus on that a lot. And I think IT skills are really important because if you can't write a report or put together a spreadsheet, or you don't know how Word works, and you don't know how different packages work, that can be a problem."*

Graduates then find it easier to learn other specialist software once in the workplace.

Skills among graduates in GIS varied considerably, and were very dependent on individual experience, with some saying graduates had good GIS skills and others finding it lacking. Some participants commented that graduates had used GIS in the classroom, but could not combine it with fieldwork skills and use it onsite with the app. Those who thought graduates lacked GIS skills still thought their broader exposure to IT on their degrees would help them learn GIS packages. The interpersonal skills that graduates had already developed related mainly to presenting, public speaking and working to deadlines.

The skills graduates needed to develop was a lively discussion, where there was widespread consensus across the workshops. Figure 5 below shows the 10 most prominent skills that graduates need to develop, identified from the seven workshops.



**Figure 5 Skills Graduates need to develop from employers' perspective**



In terms of ecology, there was a common view across the workshops that graduates needed skills in species identification and practical field skills. In the discussion, there was frustration that more time was not spent during degree courses on species and habitats from the UK and Ireland. Knowledge of environmental law and policy was uneven, with many respondents thinking graduates covered it on their degree but struggled to 'practically apply that knowledge to UK projects' and that their knowledge is 'weirdly out of date'. Land management did not come up prominently in the posts but was a notable discussion point in the workshop with local government, AONBs and National Parks. Local government needed ecologists who could communicate with landowners. An AONB in southern England gave an account of hosting a site visit by geography graduates currently undertaking a PGCE. Although they had studied from books, they were unable to recognise and understand what a floodplain was. Their knowledge of plants was lacking, not being able to recognise an ash tree and being unfamiliar with the term ash dieback. Farming and land management techniques were also highly unfamiliar.

*"Someone piped up and said, 'do they grow straw'? And at which point, I couldn't contain myself and saying why there's a three-year rotation to wheat, barley, and rape. At which point they were all sort of glazed eyes. And I just thought that is the difference between knowing the curriculum, and a good education."*

Even more prominent than ecology skills, was the weight given to interpersonal skills. There was a need to develop these outside a university context. Some sector specific points arose here, with consultancies wanting graduates to develop 'hard consultancy skills'. When prompted for an explanation of what this meant, it was defined as:

*"I was calling it hard consultancy skills, not in the sense that they're hard. In the sense of being able to develop and adapt the way you communicate with people inside the business and outside of it as well.... Basically wording an email, working in-house with different disciplines, the internal client as we call it."*

NGOs, local authorities and AONBs were also concerned about communication, in their case focusing on landowners and the local community. Environmental regulators highlighted the need to develop 'listening skills - genuinely listen to other peoples' concerns'. Other 'soft' skills including project management, people management and stakeholder engagement were also highlighted. While report writing was generally viewed as a strength of graduates, a few respondents thought they needed to move this outside the university setting too, and write in plain English and avoid academic sounding language. These gaps did not work in isolation and as one participant from an environmental regulator put it 'they struggled to work within constraints - budgets, capacity, regs (regulations).'

The mirroring of skills graduates need and those people from vocational pathways already have was striking. What one has the other lacks and vice versa, raising two possible options. To change the way degree and vocational courses are currently delivered so that they both align more closely with what employers are looking for. This could mean taking approaches to learning from vocational courses that work well and making them more widespread on degrees. The other option is to have teams of ecologists with both graduate and vocational members, so across the team there is a full range of skills. We explore both of these options in our recommendations.

### 1.2.3 The perspective from new entrants into the profession

New and recent entrants into the ecology profession were asked to evaluate the degree or vocational course they had completed and answer two questions:

***What were the three most useful things you learned on this course?***

### ***What three things do you wish you had learned more about on this course?***

The purpose of these questions is to investigate how effective degrees, postgraduate degrees and vocational courses in ecology and related subjects are in preparing students for their careers as ecologists. Open ended questions were used in the survey to prompt unrestricted responses about the academic content and practical experiences provided.

The data was initially analysed for each question separately by transferring the data to two spreadsheets. The first question gives positive views of their course content by listing the elements respondents considered most useful. The second set of data allows them to identify further knowledge and skills they required to meet the demands of the workplace. There can be overlap, for example someone may respond by saying they found a particular fieldwork experience useful but would also like to have learned more fieldwork skills. Of the total 113 completed responses in this section of the survey, almost all respondents provided the full requirement, listing three elements of their course they found most useful in the first data set, and items they wished to add to courses in the second.

Keywords were then added to allow some standardisation of the responses for data analysis. A restricted set of ecological terms were chosen based on their frequency in the data. These terms were structured into a hierarchical keyword set. An extra data field was added to each respondent's record and the keywords applied based on their three entries. This allowed the removal of synonyms and provided a structure - by grouping topics under broader headings. The keywording produced major groupings under Ecological Surveys, Conservation Methods, and Data Analysis. More specific entries reflect a strong interest in GIS, but also include skill sets such as Species Identification. Interrelated with these subject based responses, are comments about how the learning took place, highlighting the importance of practical field work and positive views of work placements.

The hierarchical structure was used to enter all terms at higher levels to generalise some very specific entries. For example, a participant response of 'Phase 1 Habitat Survey' would have this item added in their keyword section but would also have the next level term 'Habitat Surveys' entered together with the top level 'Ecological Surveys'.

<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>
<b>Ecological Surveys</b>	<b>Survey methods</b>	<b>Thermal imaging</b>	
	<b>Species surveys</b>	<b>Protected species survey</b>	<b>Bats</b>
	<b>Habitat surveys</b>	<b>Phase 1 habitat survey</b>	
		<b>UKHab UK Habitat Classification</b>	

The same keyword set was used for both questions and no limit was set on the number of keywords applied in a respondents' entries. As well as the three entry boxes provided in the survey, some respondents gave detailed responses in one entry that covered several topics. These topics were all keyworded to avoid loss of data. After analyses of the terms used in the responses, the data was organised under 12 main Level 1 categories:

1. Conservation methods
2. Ecological Surveys
3. Data Analysis
4. Species identification
5. Environmental Law and policy
6. GIS
7. Research skills
8. Communication skills/Transferable skills
9. Workplace skills
10. Foundation science
11. Ecology careers
12. Learning environment

Some of these categories relate to specialist areas within ecology but other topics such as communication skills and research skills were frequently included. Some entries mention the learning environment, particularly practical skills gained during work placements. In the second dataset, the things they wish they had learned more about, there was increased reference to information about career pathways in ecology and general skills needed in the workplace or running a consultancy.

### 1.2.4 Analysis of 'Most useful things learnt' responses

**Figure 6** What new entrants into the ecology profession thought was most useful on their course



**Conservation methods** was the Ecology specialism with the highest number of responses in this dataset, with 35 entries. Items within this keyword grouping, based on the topics included in the survey entries, included:

Conservation methods	Practical field skills	Equipment use and maintenance
	Environmental monitoring	
	Ecosystems	
	Ecological restoration	
	Land Management	Farming
Forestry	Tree management	
	Habitat management	
	Biodiversity Action Planning	
	Invasive species	
Mitigation		

**Land or Habitat Management** terms are used in 12 responses. One respondent on a vocational programme gives this list of useful elements in their course:

*"Various aspects of species, trees management, land management, and power tools aspects"*

Another response states more general approval of:

*"Hands on, practical knowledge and experience of managing different habitats"*

The highest rating within the Conservation Methods grouping is for **Practical Field Skills** with 20 entries. Many of these responses use a general term such as field skills, but others give more detail as in the examples below:

*"Practical Field skills (GCN (great crested newts), species specific)"*

The same respondent adds, talking about the way learning took place as his second useful point:

*"Work based learning section of the course (working with a local conservation organisation)"*

The practical field skills responses often link these skills to other areas of the curriculum, such as species identification and survey work. Some are particularly concerned with the safe use and maintenance of equipment used by ecologists in surveys and habitat management.

**Ecological surveys** were a frequently represented grouping with 31 entries. Both Species Surveys and Habitat Surveys are included in the responses, sometimes response expanding this to include particular methods and standards:

*"Detailed study on ecological surveys for UK species"*

*"UKHab and Phase 1 Habitat Classification"*

**Data Analysis** topics produced 18 items. Eight of these specifically refer to the R software tool. The Data Analysis heading includes other quantitative skills, mainly statistics. One respondent gives these two entry examples:

*"R coding introduction – based on biology" and "Quantitative skills and field skills"*

**Species Identification** terms occurred in 24 entries. This subject group includes the general topic of classification, but most entries refer to Species identification:

*"UK plant and animal Identification"*

*"Use of botanical keys"*

*"Mammal survey and identification"*

There was no dominant interest in any one species, group of species or methodology but a mixed response included protected animal species such as bats and using plant identification keys.

**Environmental Law and Policy** was included in 19 responses, mainly in very general terms. There is an explicit focus on law as it affects their roles as professional ecologists in some entries, and others are more precise concerning particular policy areas:

*"Understanding of UK policy on ecology and biodiversity"*

*"Professional Working Responsibilities laws and Legislations in the land-based sector"*

*"EU directives (Habitats, Birds, EIA, WFD (water framework directive))"*

The related topic of **Environmental planning** had only six entries, with knowledge about four specific approaches mentioned.

Environmental Planning	EIA Environmental impact assessment
	EclA Ecological Impact assessment



## Specialist Skills

Alongside these major elements of the curriculum, were individual topics that rated highly as useful ecology specialisms.

**GIS** was entered as a useful skill in 30 responses. Most entries simply used the term GIS but the level of interest indicates that respondents view this as an important element of their course. Different versions of the software are mentioned – How to use QGIS or ArcGIS. Responses emphasise the need for intensive GIS training, perhaps driven by an awareness of the need for this skill in their future roles and when applying for jobs.

*“Technical skills in the use of GIS software packages”*

*“GIS map making and analysis”*

*“GIS skills that I could reference in job applications”*

**Research Skills** Topics within this keyword included general skills not explicitly part of the ecology subject area. However, there were 27 responses referring to some element of research as a useful outcome from their studies. Critical analysis of reports and data, and the ability to organise research projects are noted:

*“The importance of evidence-based research and how to identify/review reliable scientific research (literature review)”*

*“How to put together a research project”*

*“How to carry out scientific research for my thesis (i.e., What questions are you asking, how to go about collecting data, field work, data analysis etc.)”*

*“Research techniques and report writing”*

How to put together a research project and how to carry out research start to overlap with project management skills but are not articulated in this way.

Report Writing also occurs as a common term in the data with 31 entries. As a keyword, it is part of a general set of Communication skills in the hierarchy, but its frequent use shows its particular importance to respondents. As well as generic report writing, a few responses were more detailed, mentioning some of the kinds of reports ecologists write and the process of report writing:

*“How to write scientific reports and reference academic literature”*

*“How to write a range of reports e.g., PEA (preliminary ecological appraisal)”*

*“Communicational skills e.g., presentation skills, transferable skills, report writing”*

**Communication skills** as a broad keyword grouping was the highest rated entry in this set with 38 entries. As well as report writing, it included presentation skills, networking and communicating with other experts and stakeholders. Entries elaborated mentioning:

*“Speaking to experts confidently”*

*“Networking with local conservation groups and ecologists”*

Broad transferable skills were also mentioned, with the benefits of group work listing three times.

*“Presentation and group work consultancy module”*

**Transferable Skills.** Other general transferable skills include IT skills and Project Management but there are very few entries.

**Workplace skills** such as finance and budgeting or people management are absent from the data. Time management to meet deadlines is the one item appearing for this keyword group but only has four entries.

**Foundation Science** The survey revealed one further useful area of study, grouped in this data set under the keyword Foundation Science. There are 27 entries relating to the areas of science reported as useful to support the more specialist elements of their courses. Participants did value the structure that this foundation knowledge gave them and found it useful after their course. Terms in the responses these include:

- Ecology, evolution, genetics
- Review of ecological theory, science and literature
- General ecology & ecosystems knowledge
- Botany course
- Physiology of animals
- Water Chemistry

**Learning Environment** is a grouping for entries where respondents mention the context of a learning experience as part of the 'useful' experience. All the mentions of work-based learning and placements are positive. Seven entries come into this category.

*"Placement year at Field Studies Council with field skills in ecology."*

*"Work-based learning section of the course (working with a local conservation organisation)"*

*"That my employer is willing for me to blend access and ecology in my day-to-day work"*

The final observation is from someone currently on an apprenticeship which includes ecology.

### 1.2.5 Analysis of response 'What three things do you wish you had learned more about on this course?'

We then asked respondents what the three things on their course they wished they learned more about.



*'Wider habitat management – more contextual information on how to restore sites/write management plans'*

*'Restoration of specific habitats'*

*'Management and mitigation works for ecological consulting'*

The third example here makes explicit the requirement for skill levels to align with typical workplace activities.

**Practical Field Skills** was, as in the 'most useful things' data, the highest rating topic within this Conservation Methods grouping. Respondents value the existing practical elements of their courses but clearly wish for a much more practical focus within the curriculum. Of the 38 responses many respondents simply ask for:

*'More in field experience'*

*'More practical experience'*

*'Transferrable field skills'.*

Again, detailed comments range from the general to the very specific:

*'More focus on certain useful, rather than academic, information'*

*'Hands-on management'*

*'Basic training on power tools, like chainsaw and other aspects of machineries'*

This desire for a practical, hands-on approach to learning also carries across to other areas of the curriculum, particularly Ecological Surveys and Species Identification.

**Ecological surveys** were another frequently represented study grouping in the 'most useful things' data. They are the highest rated topic in the 'wish you had learned more about' data, with 49 entries. Many respondents simply requested more survey content in courses, with an emphasis on practical teaching:

*'More practical survey skills experience'*

*'More in depth surveying guidelines (ecology)'*

*'Practical ecology field survey techniques'*

More detailed responses mention specific methods such as Phase 1 Habitat Surveys, or link to standard workplace requirements:

*'How to undertake surveys common in the field'.*

Species related comments again range from general to very specific:

*'Ecological survey methods (especially of animals; vegetation surveys were better covered)'*

*'More course content relating to surveys used by ecologists (such as protected species surveys)'*

*'Protected species surveys and licensing'*

*'Sound analysis of bat species and birds'*

*'Bird survey skills e.g., calls, songs and identification'*

There was almost equal interest in habitat and species surveys. Twelve entries concern habitat surveys and fifteen relate to species. There was a particular interest in protected species, with twelve comments.

Ecological Survey responses reflect the many specialisms in this area of study, particularly in relation to species. It raises questions of the need for specialist opportunities within courses that allow participants to follow their interests, or the role for further short course training after joining the workforce.

**Data Analysis** with just seven entries, showed a reduction on its previous rating. The focus is for more coverage of the 'Statistical analysis of data'. Some entries request more advanced statistical methods, others need to develop statistical skills in a way they can more readily engage with:



*'Robust statistical analysis'*

*'More frequent use of statistical analysis in bite-size portions so not to be overwhelming'*

**Species Identification** was another major subject focus in this dataset with 38 entries. The majority wanting expansion of this area of their course simply added Species ID to their list of things they wished they learned more about: 'More techniques on species ID.' Some responses emphasised the importance of practical experience in learning this topic and others wanted a greater depth of study:

*'Field Identification Skills'*

*'Species and habitat identification'*

*'Identifying species by field signs'*

*'Practical animal identification skills'*

*'Plant identification skills and general units on botany'*

*'In-depth study of specific animals (most modules were general with a few species-level examples)'*

**GIS** was entered in the 'most useful things' data in 30 responses. This reduces to 16 in this part of the survey. The main request was 'more GIS' but opinions varied over which version of the software:

*'Standardized GIS course used in businesses'*

*'ArcGIS and digital tools'*

*'Use of QGIS instead of ArcGIS as this is more widely used in the workplace'*

As noted in the previous dataset respondents are linking GIS to their chance of employment as ecologists:

*'GIS – we had no introduction to this and its very relevant to future careers paths'*

**Environmental Law and Policy** **Environmental Law** had 29 entries in this part of the survey. Generic entries were frequent, such as:

*'POLICY AND LAW – Environmental policy and legislation'*

But there was also an emphasis in understanding the practical application of legislation, policies and regulations:

*'More on policy and legislation and how it works in practise'*

*'The use of environmental legislation (using it in practise)'*

Some respondents refer to improving their understanding of the broader frameworks of this topic:

*'How ecology and legislation work'*

*'Current legislation/policy relating to the environment in the UK and role of Government bodies'*

This final point related to the workshop with Government regulators, who were keen for more entrants to know what their organisations were and how they worked in practice. Other entries related to more specific legislation and policy approaches. Most focus on UK legislation but there were some requests for more information about Ireland. Biodiversity Net Gain also was also referenced in six entries:

*'Laws and legislation that protect the environment and native species, specifically in Ireland'*

*'Policies affecting wildlife'*

*'Markets, BNG, natural capital, systems'*

The number of entries in the topic reflect the importance of the legislative framework for this group of respondents at an early stage in their career, attempting to understand their role as ecologists within this wider context. This entry links an understanding of ecology career paths with law and policy.

*'All the different careers in conservation – my MSc was all about conservation science and research, I would have liked to learn more about different career paths such as how policy, politics and legislation plays a key role in conservation.'*

This mirrors points made in the workshops where both local authorities and in particular regulators, wanted people to know more about their organisations and their function.

The associated specialism of **Environmental Planning** regulations and assessments produced 14 comments. Two of these relate to the Planning process:

*'Report writing suitable for planning applications'*

*'Planning Jargon'*

The remainder all refer to specific reports such as Ecological Impact Assessment, Biodiversity Impact Assessment and Preliminary Ecology Appraisal.

*'Detailed Environmental Assessments'*

*'How to write AA's, EclA's, NIS's, environmental law and policy etc.'*

*'How reports differ for EIA, HRA (Habitat Regulations Assessment) etc.'*

*'More higher level PEA (preliminary ecological appraisal) and BREAM'*

These are core skills likely to be encountered at the early stages of employment as an ecologist, and uncertainty about their own competence is reflected in these entries. These also link to other comments in the Report writing section of the survey.

**Report writing** was included in the survey as a topic within Communication skills. The 10 respondents included the need for writing reports in a business context, uncertainty of what is expected of them, and for basic skills in writing well-structured reports.

*'How to write reports in a business rather than academic manner'*

*'Report writing structure'*

*'Consultancy style report writing'*

*'Greater guidance on reports and what's expected'*

This closely mirrors the findings of the workshops, where participants thought graduates generally had good report writing skills, but some adaptation is needed for a work context.

**Communication skills and Transferable skills**, alongside the core subject groupings within ecology were less subject specific categories that appeared in the respondents wishes for additions to their curriculum. The **Networking** topic in Communication skills appeared in five entries including:

*'Contact with other people in the industry outside of the university'*

Transferable skills produced few comments in this section of the survey. Two respondents wished they had more knowledge of Project Management and three entries refer to IT skills, including:

*'Training in the software used by ecological surveyors'*

**Research skills** only had one response in this set of data but there were entries concerned with the provision of Foundation science. The 17 entries in this section were similar to the first data set. **Foundation skills** in botany, biology, and ecology are repeated in this wish list:

*'Greater range of botany lectures'*

*'More chemistry'*  
*'Animal biology'*  
*'Land ecology/ landscape ecology'*  
*'More about the science behind systems'*

**Learning environment** had eight responses, all confirming the preference for extra learning in a practical setting. One sums it up as 'Experience is key'. The others mainly refer to Work Placements:

*'Industry work experience'*  
*'Work placement as part of course'*  
*'More site visits'*

**Ecology careers** is the section showing the largest divergence between the two data sets. Only seven respondents found career information a useful part of the studies already. Thirty wished they had been more informed about career pathways; the roles involved when working as an ecologist; skills needed in business, especially consultancy work:

*'How can what we learnt in our degree(s) and skills/experience be used to start a career in conservation'*  
*'More about vocations/ pathways into the field'*  
*'Roles within the sector'*  
*'Careers and what they involve day to day'*  
*'Application process for Ecology jobs'*  
*'Job related modules i.e. environmental consultancy'*  
*'Job opportunities/career paths in the environment sector E.g. consultancy – course was very academic focussed'*  
*'More specific skills related to working in consultancy'*  
*'Ecological consultancy jargon'*

## Conclusions: developing skills in early career ecologists.

It is unrealistic to expect either a degree or a vocational course to give people entering the profession all the knowledge and skills they need to work in any part of the sector. More agreement is needed between providers (colleges and universities) and employers about which skills are best developed in an educational setting and which are best developed in the workplace. Those not covered, or covered in depth during studies could then be acquired in a workplace setting through mentoring, on the job training, short courses, or more structured graduate induction programmes. Both parts of this balance are not working to the benefit of career entrants and are an important component of the skills gap. Currently, graduates are leaving unprepared in many key ecological skills that are core to most roles across the sector – in particular practical field skills, species identification, ecological survey techniques and environmental law and policy. In the case of law and policy, coverage on many courses is out of date and the knowledge difficult to apply to real projects. In the case of survey techniques, out of date techniques is also an issue (e.g., not using UKHab in the correct context) but also too little time for students to practice survey techniques. Universities and colleges need to look at, not just including key skills in the curriculum, but how they are developed. To become proficient in a skill, learners need to be introduced to it, have opportunities to practice it with advice, and then deploy it on their own initiative. People early in their career are having to address these key skills gaps in ecology themselves, by volunteering or paying with their own funds for short courses. Employers in the workshops also noted these missing ecological skills, but put even more emphasis on the need for graduates to develop communication skills, and a need for both graduates and those from vocational courses to develop project management skills. Both employers and new entrants into the profession emphasised the learning environment and skills that were acquired through placements and collaborative projects that involved employers. Having identified the skills needed, in the next section we look at how skills are acquired in the ecology profession.

## 2.1 How skills are developed

This section of the report begins with employers' attitudes to recruitment in the stakeholder interviews, as this directly impacts on how an organisation subsequently trains and develops employees. How skills are developed is also a key theme we explore in the sector workshops, seeking participants views on the four main ways that skills are developed:

1. In-house training programmes
2. On stand-alone short courses
3. Through volunteering
4. Through structured programmes (e.g., the CIEEM early careers programme; stacked micro-credentials)

Using the learning from the new and recent entrant survey, we then explored from their perspective what kinds of learning at college and university had best prepared them for their work as ecologists. We also look at the role of volunteering experiences and short courses from their perspective.

### 2.1.1 Employer perspectives – overall attitudes and approaches to recruitment, training and development

Using the learning from the interviews with employers, we explore below how skills and knowledge are developed before employment i.e., what capabilities employers want to see new employees arrive with, and then during employment as employers try to develop the workforce which they need. Many employers interviewed commented that the skills they need are not available to them 'off the shelf'.

Organisations have adopted a range of strategies to develop the skills of their employees. For example, larger consultancies appear to be in a stronger financial position to develop skills in-house through a mix of mentoring and paid for training. NGOs have the least available funding available to develop ecology skills, especially the smaller or regional NGOs.

Reported approaches to recruitment were closely interwoven with how organisations approach subsequent skills development. Recruitment processes are specifically examined in section 2.3, but this section begins with a brief overview of how recruitment strategies and cultures determine how organisations then go on to develop the people they employ.

A notable facet of the interviews with employers was how little, relative to their other issues, they had to say about training and development of their employees. In effect, some organisations are doing little or nothing in this regard and rely on recruiting people with the skills and experience they need. They had far more to say in relation to the recruitment of enough people with the right skills.

The interviewee trying the hardest to develop their employees skills we spoke to was an organisation under the most pressure, based on the details shared in the interview:

*"We are going to all the universities giving lectures, holding seminars, providing bursaries and placements, and supporting a graduate recruitment programme – we are working hard to find people who we can bring into the profession." (Interview with Irish consultancy)*

The one other interviewee and organisation 'trying hard' had a strong sense of mission in relation to doing whatever they can to develop the next generation of ecologists. They do this by leveraging a mix of public and charitable funding and by looking for opportunities to 'add value' to people's skills and experiences wherever possible:

*"The national agenda is ambitious – great policies but 'no trousers'. We develop partnerships as no-one has the resources alone. We work with students e.g., on dissertations, review support, build relationships to help them do things which are relevant and useful to us, get real experience. But we cannot offer them a job at the end of it. Do not have the resources to develop skills and experience without support from others e.g., Princes Trust." (Interview with National Park, Wales)*

Amongst those we interviewed, the fundamental constraints on staff development were reported as money and time, both of which are generally in shorter supply in smaller NGOs, but also in the National Parks:

*"People with technical specialisms like ecologists are really hard to find, and often not affordable – we lose out to agencies (who can pay more)." (Interview with NGO, England)*



*"Not enough money for paid courses. Completely new people cannot be supported as we do not have the capacity. We want to do more, especially with diversity in mind, but we do not have the money." (Interview with NGO, Wales)*

## 2.1.2 Recruiting and developing graduates

The interviews highlighted a wide range of attitudes and experience in relation to graduates, with an equally varied range of views on how valuable degree entrants are to the sector. For some, recruiting graduates was the primary way in which they have filled vacancies and they thought this would continue to be the case. The approach was to recruit people with degrees, as some organisations believe this demonstrates the potential they require to make good appointments which they can develop more quickly in-house:

*"We almost exclusively recruit graduates and train them to do the job. We've had a good experience overall, we have found some excellent people. Need people who can take responsibility and learn fast, motivated people are needed." (Interview with consultancy)*

This perspective was not apparent at all in the workshops i.e., that people with vocational qualifications might be considered as less able and have less potential, and so we do not infer that this is either the reality or a more widely held belief. It may reflect the experience of this interviewee, and we note that their organisation also recruits more widely than just graduates, not least because it cannot find enough graduates to fill posts. We do not have evidence that people who can 'take responsibility and learn fast, and who are motivated' will be exclusive to any entry route to the profession (whether graduates or vocationally trained or other people).

There is further evidence of muddled thinking and practice from other stakeholder interviews. The following quote illustrates the reliance on recruiting graduates with experience, which will be harder for recent graduates to demonstrate that they 'have done the job' in some way. Similarly, if the preference is for graduates regardless of experience, how do vocationally trained people fare when applying to this organisation? They ought to be in a good position given their potentially stronger range of practical experience. But do they find themselves passed over for people with a degree and fewer practical skills?

*"Historically, we had a heavy reliance on graduates and this culture still pervades the organisation - graduates recruit graduates! In this regard, there is no consideration of whether people have the skills or not. However, our system is competence based and so, in theory, if you can demonstrate you have done the job, you have a good chance of securing the role." (Interview with environmental regulator)*

Other interviewees were clearer about their preferences - they believe that people with degrees do not offer the range of skills and experience that they need, although they do not necessarily then recruit people with vocational qualifications:

*"Graduates have less practical experience than they used to have, and are less prepared for the physical challenges of the role. They have more theoretical knowledge, but it's not actually that helpful." (Interview with NGO, Wales)*

Others were critical of university courses and how they prepare people for practical ecology in the UK:

*"Universities seem to be offering exotic holidays abroad (turtles), so students need to come from more affluent backgrounds - courses are not connecting to the needs in Britain. Courses need modules on surveying and monitoring, specimen identification to make them into good naturalists." (Interview with National Park, Wales)*

To counter this, there was a view that more attention should be paid to the content and the way it is delivered within degrees and other qualifications. The content should be more co-produced with the sector:

*"The design and content of courses is crucial and colleges, universities and trainers need to co-design this with the sector. We (the ecology sector) need to learn from other sectors how best to do this and make the provision work." (Large NGO, England)*

Some organisations value placements as a way of developing skills and experience and would like to see this offered more often, collaborating more closely with universities.

*"Work with the Universities e.g., on dissertations, review support, build relationships to help them do things which are relevant and useful to the employer. Students get real experience." (Interview with National Park)*

How appropriate graduates were to the interviewees' organisation largely depended on what roles they wanted to fill. For some, graduates offer the potential to learn quickly on the job, but for others they may not be what is needed at all. The range of attitudes to recruitment and training highlights the importance of fully understanding the requirements of all parts of the sector and developing training and development strategies which meet those needs. Organisations will need to be active partners in the process of supporting and developing skills in new, recent and established ecologists.

As an example of a different approach, an interview with an England-based NGO further highlighted how the employment requirement and context is paramount to recruiting and developing the people organisations need. The organisation needs people with more than ecology skills and had a challenging view on where important skills can be learnt:

*"Finding people with ecological and community skills is really hard and we need to grow our own (training them in-house and with short-courses) - hard to teach people skills whereas knowledge of plants can be taught more easily. Lots of skills can be taught away from university." (Interview with NGO, England)*

However, they also acknowledge that this approach has its limitations and that deeper levels of knowledge and skill are needed at times e.g., an understanding of how a habitat works at scale, such as a wetland or ancient woodland. However, for this organisation, that depth of knowledge was not required.

Mentoring plays a prominent role in developing skills and experience for many, either through the support of a formally appointed mentor, or through more informal day-to-day working with colleagues who know more about an area than others.

*"People are normally supported by mentoring and free courses." (Interview with NGO, Wales)*

*"There is an expectation that people need to spend time learning as part of their continuing professional development."*

*"Tends to be more informal learning, shadowing an expert to learn more about plants, doing some online learning which works well. Most of the learning is done on the job and happens every day. NGOs do support each other e.g., the RSPB shares learning opportunities." (National NGO)*

And this example, from a larger, regional NGO in Southern England which tries to make a comprehensive offer to trainees:

*"We offer some paid traineeships with a mentor, and training to achieve the relevant tickets, but it is hard to find the right academic partners."*

Working with an academic partner would enable them to provide accredited training and experience more relevant to the conservation work they do. Local land-based training and development capacity has been lost in recent years from their part of England with the loss of two colleges over the last ten years or so. But they also highlighted the need for a wider range of skills and experiences in order to meet their goals:

*"Ecologists lack 'hard' practical skills and their time management is often poor. We need a range of specialists, not just ecologists and conservationists. Career routes are limited and need to broaden out to bring in a wider range of experience and skills. Diversity in NGOs should be about skills and experience as well as gender and race."*

Developing the required skills is sometimes the pragmatic choice. The following quote reflects comments in other interviews where the organisations were not standing on principles, but doing whatever they can to meet their employment needs:

*"We try to develop people in-house. An interest in nature is a good starting point, then we provide training and support - formal training, informal support across the team, learn what's necessary for the jobs to hand. It's worth the time and effort and we have little choice." (Interview with NGO in Wales)*

This overlaps with recruitment approaches described later in the report. One starting point for beginning employment as an ecologist is a strong interest in nature. That could be one specific field such as birds (demonstrated through a strong personal interest), or a more general interest in flora and fauna (demonstrated by membership of a recording group).

We reflect that there is nothing wrong per se with taking such approaches, especially in challenging circumstances, but we wonder how sustainable such approaches are for the sector as a whole and in the medium and longer-term. Skills and experience gathered in these ways risk being piecemeal and may lack 'portability' by providing the employee with accredited and recognised training, those that result in 'tickets' and licences. Entrants through personal interest would strongly benefit from some kind of more structured learning, several options for which are presented in our recommendations. It's very 'hand to mouth' for the organisations involved, especially as they struggle to bring structure to what they offer. However, if the sector is true to its word of valuing experience highly, people who develop their capacity in this context should be employable, especially where the recruitment process is supposed to be competence based. What they lack is the easily recognisable 'badge' of having a degree.

### 2.1.3 Recruiting and developing people with vocational qualifications

Views on developing vocationally trained people in stakeholder interviews were also varied, with questions asked of both routes into the sector. Practical skills gained through vocational training were valued alongside the skills which graduates may have, rather than making an 'either / or' binary choice:

*"We need to bring in people with wider experience as well as graduates, but we do like apprenticeships as they give people practical skills. But what we really need is good interpersonal skills regardless of your training; often missing in degree courses." (Interview with environmental regulator)*

One interviewee questioned the need for more graduates, especially in the context of new habitat challenges:

*"Do we need more graduates or people coming through other routes? Peatland restoration requires a tiered level of skills, from some level 6 qualifications (financial, expert knowledge, planning interventions etc.); to foreman skills, managing machine operators etc., spanning levels 3 to 6." (Interview with National Park, England)*

These views on degrees and vocational qualifications provide the backdrop to training and development efforts by organisations. Organisations employ a range of approaches to developing skills and have varied attitudes to recruitment. However, practical skills alone meet only part of employers' skills requirement, and the perceptions from some interviewees was that graduate entrants were more likely to progress in the ecology profession from field work to more senior roles. Overall, the employers interviewed were more likely currently to recruit graduates with at least some skills and experience, filling any skills gaps through mentoring and short training courses, rather than in recruiting vocationally trained people.

### 2.1.4 Vocational training as 'the answer'

Those involved in vocational qualifications were, understandably, enthusiastic advocates of the approach:

*"I think the thing that they (people on degree courses) struggle with very often with that is it's usually a day a week, or it's only for a few weeks of their course, or, it's a very short little snippet where they get a little taster of those practical skills. They're not doing it day in day out...(those from an apprenticeship) - They're familiar with their species IDs, they're familiar with what does a Hazel copse look like, how should it look. What we want to try and achieve when we talk about mob grazing, they've had those experiences out there."*

When asked to comment on the extent to which they felt training and recruiting more ecologists through vocational routes was 'the answer' to the capacity crisis, responses were often supportive in principle, but somewhat ahead of actual practice. Interviewees like the idea but do not often carry this through into recruitment. One perception was that there were not many vocational qualifications which contained ecological content, and therefore a limited pool to recruit from.

*"We've not often done this, but they can be really good if they've had a good and varied background. I know of a reserves manager who said that she didn't need a degree - it was the learning done afterwards that taught her how to do the job - and I agree with this. In practice, not many people with vocational qualifications apply for roles, and I think this is because there are not many of them out there." (NGO, Wales)*

As we shall see later this perception is not the case, and a wide range of existing qualifications have ecology content. Other comments in support of vocational entrants highlighted points raised in our brief, that a degree is not the right pathway for many people.

*"Vocational routes can be helpful across all sorts of careers - not everyone is academic and more should be done to support people who are more practical. They may then develop the confidence to enter a degree, but degrees are not the be all and end all."* (NGO, Wales)

*"People with practical experience are what is needed. Transferable skills are really important and this opens the door to career-changers. (NGO, Wales)*

Most of the interviewees see a role for people with vocational qualifications, but appear to believe that their roles will be more practical in nature and less 'strategic'. Vocational qualifications can help to address part of the capacity problem by providing people who can do the practical work, but are less likely to provide the people who will plan and direct work at scale. Most of the interviewees hesitated to be explicit about the roles which graduates and vocationally trained people could play in their organisation. The impression formed was of the interviewees not wanting to appear to pigeonhole people into roles limited by the type of qualification they have. This understandable sensitivity did not help them to articulate how the different organisations might deploy a mix of people with different qualifications, and how this might help them deliver their goals.

The clearest articulation of how a blended approach might work came from a National Park in England which was wrestling with the challenge of restoring peatlands. Their vision is quoted here in full.

### BOX 1. Peatland Restoration - a model for how to build blended teams

The peatland restoration sector requires a tiered level of skills, ranging from top-order expertise in finance, expert ecological knowledge, and skills in planning interventions at landscape-scale, to on-the-ground skills, managing teams, skilled machinery operators and others to do the work. The skill requirements span NVQ levels 3 to 6, with fewer individuals capable of performing the highest-level tasks. You need people with the skills and experience to survey the land in the first place to know where and how best to intervene - this might be graduates but could also be vocationally trained 'specialists' in peatland surveying.

This team structure can be designed, costed and planned for in relation to the task at hand. It can be scaled in relation to the number of hectares requiring restoration, determining what skills are needed and where.

The sector must connect to manifesto and international commitments with **quantified arguments** e.g., the area to restore, the number of people required, their skills and the lifespan of the work. There might be 1,000 jobs for 30 years for peatland restoration alone.

To address these challenges, a systems-based solution is needed, involving multiple actors and addressing the sector's skills gaps. A major challenge is the short-term nature of contracts, typically 12 months, which makes it very hard for contractors to plan and invest. Forestry England is now issuing longer-term contracts to provide more security. The ecology and conservation sectors need to learn from this, as do funders.



*Photo: Penny Anderson*

### 2.1.5 Developing skills in the ecology sector: the advantages and disadvantages of different approaches.

In our workshops, we asked participants to reflect on the advantages and disadvantages of the different ways we can build skills in the sector. In common with our earlier activities, we encouraged them to add their thoughts using electronic post it notes, discuss the points they had shared and ask questions about points others had shared. Rather than repeat points, we encouraged people to put a tick next to a point someone else had made that they agreed with. An example from one of the workshops, to illustrate how this worked is below in Figure 8. We also draw on our responses from stakeholder interviews and their perspectives about the different ways to build skills.



Figure 8 Example of our virtual whiteboard about building skills in the sector

## Recent graduates

### Skills they already have

- good foundation in theory and survey methods
- Project management (beginner-level)
- good understanding of environmental law and policy
- Often have GIS & research experience
- Knowledge of latest developments in discipline

### Skills they need to develop

- Experience working in/with planning system
- basic practical skills in land management
- Land management and understanding of farm businesses
- practical applications of the theory into real world projects/jobs
- Experience working within constraints (low-capacity, budgets, regulations, etc.)
- Working with non-ecologists (people/team working skills)
- grant funding experience
- procurement, budgets, etc.
- real world experience balancing multi disciplinary
- practical skills for land management- e.g. chainsaw, brush cutter, tractor etc

## Vocational career pathways

### Skills they already have

- good practical experience. Certificates for Chainsaw/Spraying/brushcutters etc
- Good grounding of the use of land management techniques
- Good idea of how 'real world' works (short-staffed teams, etc.)
- experience working with volunteers or as volunteers
- Better interpersonal skills with land managers & contractors
- Good chance this could be a second career, in which case they could bring a wealth of experiences and skills from a range of sectors
- Good level of practical and real world experience
- species id

### Skills they need to develop

- Strong Systemic/theoretical ecological knowledge
- political awareness
- Project management, budgeting & financial processes
- may lack some of the theoretical knowledge
- grant funding experience
- If young and/or first job, they may need support in basic workplace practices/responsibilities.



## In-house training programmes

These were often driven by pragmatic necessity, and the pressing need to develop the skills of employees. They can be delivered in a more affordable way than sending employees on externally delivered short-courses. There are opportunities to customise them to a particular organisation and its needs. Training could even be specifically directed to staff needs around a particular project. There is more chance that learning is embedded than on one-off external courses. There is also the potential for good connections between in-house training and individual staff members personal development plan. When managed well, they can also nurture and support the development of skills in a team, and not only an individual, and sharing skills between team members. Using senior staff in the delivery could have positive benefits and be a way for them to pass on their skills within the organisation in a structured way. It is also an opportunity for an organisation to get consistency, and make sure all staff are at the same standard. Investing meaningfully in professional development is very likely to be viewed positively by and will assist with both staff recruitment and retention. Two participants suggested aligning them with a college or university and two suggested them leading to a recognised qualification, things we explore in our recommendations.

There were also a number of limitations and challenges identified with in-house programmes. Despite being relatively more affordable there are still costs involved - either to pay external trainers to come to the organisation and deliver them and/or re-allocate senior staff time to deliver the training. Budgets may not be stable and could vary considerably from year to year, making this difficult to rely on as a way to build skills in the sector. Despite the potential for them to be customised, a tendency was noted for them to be very generic and not customised to their context. This could apply when the trainers are brought in without funding for customisation, or when ecologists make up one part of a larger, multidisciplinary organisation. At the other end of the spectrum, they can be too focused on the specific organisation and context. What could be good for the organisation in terms of a narrow focus can make the knowledge less transferable for participants to another work context. It may therefore limit the mobility of those individuals. In being entirely bespoke to the organisation it makes the learning less transferable. As well as focus, there are questions of quality, and the training may not be aligned with sector standards. Depending on the way they are organised and delivered, they may make significant demands on an organisation's time. There is the time allocated for those participating, when organisations are already struggling to meet their current commitments. There can be administrative and organisational time commitments too, dependent on the scope of the programme. Organisations need capacity to be able to deliver them. Some participants were keen for CIEEM to support knowledge sharing between organisations that currently run structured in-house programmes.

In our stakeholder interviews, nearly all the organisations interviewed say they offer in-house training, although in practice this is informal rather than a formal programme of development. The term was used loosely to describe a range of training interventions. There was no clear evidence from the interviews that employers were offering structured training programmes. The focus was reportedly far more on supporting the development of specific skills to meet the needs of the employees' roles. Most interviewees mention mentoring as a way in which they develop skills within their organisation, although interviewees were not always clear about what this consisted of. Where specified, it consists of a nominated member of staff supporting the new entrant to develop work-related skills and to navigate the organisation. This might be a more active process where, for example, the mentor 'buddies' with the mentee to show them how to do specific tasks, or it might be a more reflective role. It does not tend to lead directly to any accredited, transferable learning or tickets unless it is backed with other training support.

*"Tends to be more informal learning, shadowing an expert to learn more about plants, doing some online learning which works well." (Interview with NGO, England)*

It has an impact on the mentor, taking time and energy, which the mentor in a smaller organisation may be required to absorb in their daily tasks, so some interviewees mention 'informal support from the team' as the way in which this is provided.

*"They learn what's necessary for the jobs to hand. It's worth the time and effort, and we have little choice (given the funding constraints)." (Interview with NGO, Wales)*

## One-off courses

Were viewed as a quick and convenient way in our workshops to ‘fill in the gaps and save time’. They can give participants specific skills in key topics. There could be advantages to going outside your own organisation, as this gives a different perspective. Although overall regarded as cheaper than other options, financial issues were still important for some, and to carefully consider costs and where they fall. The costs can quickly add up for those starting out as ecologists when paying themselves. Unless the knowledge from the short course is used, and there is some way for it to become embedded, the time and money can be wasted. The follow-up needed in-house to make sure the knowledge gained is retained is often lacking. As a result, the knowledge gained may only be retained in the short-term. There is also the potential for the knowledge learned on them to quickly become out of date. Perceptions of them varied, and there was concern that learning through a short course rather than other means may not impress a future employer, colleagues or stakeholders that you work with.

In the interviews, short courses were prominent in the discussions too. They are a way in which people can gain protected species licences and equipment tickets, or improve their species identification skills. They are most useful when the organisation’s other employees also lack the necessary knowledge, and / or they are too short of time to pass on what they know. They are also unlikely to have the necessary teaching skills and resources needed e.g., to tackle the more challenging species identification tasks. Funding is an important element, with NGOs and national parks struggling to support this (and all other) training and development approaches:

*“Normally supported by mentoring and free courses, not enough money for paid courses.” (Interview with NGO, Wales)*

Larger NGOs and consultancies can offer more opportunities as they have the funding to provide the training courses they need. The need for licences and training to meet legal requirements varies very much with the employer and the work they do, and what they might expect an ecologist to do. For example, some may want their ecologists to have brushcutter training, but others would not see this as necessary, perhaps preferring that they have a licence for handling bats - some might want both.

*“We provide training to achieve the relevant tickets, but it is hard to find the right academic partners.” (Interview with NGO, England)*

*This view from an ecologist in Wales notes that it is difficult for someone to gain a licence without also being in employment.*

*“We need ecologists to have species licences - GCN, bats, otters etc. - but this is hard to achieve without a job anyway.” (Interview with NGO, Wales)*

## Structured programmes

Can be good in delivering foundation knowledge that underpins the development of specific skills. They can be a valuable way to plug some of the large gaps between qualification levels that exist currently. Structured programmes can create opportunities for learning from peers, sharing best practice, and understanding different perspectives. To be effective, they need flexibility and very regular review to be fit for purpose. One respondent suggested that several short courses could be built together in a portfolio approach (something we explore in our recommendations as micro-credentials). These micro-credentials were only mentioned specifically once in the workshops, indicating the relatively low awareness of this option. The lack of funding was noted for structured programmes, both for participants, and for the education providers to develop them. The lack of availability was also commented on. The costs to the organisation running them, the employer and the participants are an important consideration.

### 2.1.6 Employee perspectives – learning from the new and recent entrant survey

We asked our new and recent entrants into the ecology profession for their perspective. What type of learning did new and recent entrants to the profession think best prepares them best for the workplace?

## Graduates

When asked ‘What type of learning do you think prepares you for the workplace best?’ over 80% of the responses related to gaining practical knowledge and experience, using terms such as ‘practical fieldwork and practical experience’. General workplace skills such as report writing and communication, rather than ecology skills, occurred in 1 in 5 responses.

Examples of the comments made by graduates, which reinforced the importance to them of their practical experiences at university included:

*"Practical skills (surveys etc.) that can be used in an ecological workplace."*

*"Practical learning is best to reinforce the theory."*

*"Hands-on practical with face-to-face contact with clients / landowners and other professionals."*

Other comments also emphasise the importance of ways of learning that support the development of ecology specific, and more general project management skills.

*"Planning, implementing and evaluating projects."*

*"Learn professional skills, such as environmental monitoring, environmental analysis, environmental quality assessment, etc."*

## Vocational routes

A small sample of the respondents were people with vocational qualifications. They valued the overall approach to learning in their qualifications and the way that:

*"Practical learning I think prepares you best and is my preferred way of learning."*

Their responses are different from those from the graduates when commenting on learning styles, for example:

*"I am a kinetic learner, so I need to do it myself under tutelage. I need to be shown, then allowed to do it wrong before I can get it right. I also need to do the same things regularly or I forget (ADHD), especially with technology."*

Their comments on how to support learning through demonstration followed by practice, has implications for learning in other contexts, including degrees and short courses.

*"Lecturers and members of staff physically teaching the students how to carry out the tasks and us doing it ourselves, like it would be done in a working environment."*

*"Practical learning I think prepares you best and is my preferred way of learning."*

Tutors on vocational programmes are giving careful thought in the examples we were given, to how learners acquire new skills and 'scaffolding' learning. In the butterfly example below, learners are helped to gain a specific skill at Level 2. By Level 4 they are able to collaborate with an external partner and collect valuable ecological data.

*"During the NVQ Level 2, we needed to be able to identify some species of butterfly for the multiple choice test. Our supervisors took us out to do butterfly recording and we undertook an official surveying for a partner organisation. Since then, under the NVQ Level 4, I have undertaken refresher training and organised a transect to survey with a volunteer group on a regular basis, to input to the UKBMS (United Kingdom Butterfly Monitoring Scheme)."*

## 2.1.7 What voluntary activities did new and recent entrants to the profession think helped them develop work-related skills?

### Volunteering and developing work related skills

When asked 'Did you do any voluntary activities where you developed work related skills?' 75% of the graduates responded that they had learnt work-related skills through voluntary activities whilst studying for their degree. The respondents took on varied voluntary roles. Not all related to ecology, but they may have helped to develop other work-related skills. The routes to these volunteering opportunities divide between those encountered on campus e.g., through clubs, societies and events, and those which students found and participated in themselves away from campus. Within this sphere of experience, we separated the university experience from the vocational college / FE experience to see if there were any differences between the cohorts, bearing in mind that the vocational responses formed a much lower proportion of the total respondents.

**Table 1. Experience of volunteering by survey respondents studying relevant degrees or vocational programmes**

Cohort	Volunteered at the university or college	Volunteered outside the university or college	Did not volunteer at all
Relevant degree	51 / 106 (48%)	22 / 106 (21%)	33 / 106 (31%)
Vocational	3 / 9	3 / 9	3 / 9

The volunteering opportunities on campus had the advantage of being to hand – they would typically be easier to access, within the grounds of the university or college, and might also have a strong social element to them, further encouraging participation. Some students engaged in an extensive range of voluntary activities:

*"I volunteered at the university botanic garden moth trap and established my own moth trapping project at my college. I also volunteered with the annual Bioblitz at the botanic gardens."*

*"I worked as a welfare officer on campus - did a mental health first aid course and learnt a lot about stress and mental health whilst at work and studying."*

*"I was actively involved (i.e., member of board) in several environment-related student organisations, which included organising activities such as a recycling campaign, charity collection event (Christmas carols ☺ for WWF, bike fixing events, environmental document film nights, etc. I also attended bat-watching events, organised by local bat experts, in my free time."*

Volunteering opportunities away from a campus may open up networking opportunities with potential employers, but might be harder to access e.g., they might require a car to get to the location.

*"I joined the wildlife conservation society and helped RSPB on their reserve with practical tasks."*

*"I volunteered with various charities including the Wildlife Trusts and the Mammal Society."*

Some comments contrasted what they learned through their course to what they learned through volunteering.

*"I do not think University prepared me for the workplace. Hands-on experience, through volunteering, has helped."*

Whilst the sample of vocationally trained respondents is much smaller, the volunteering they describe is less rich (with one exception) than the volunteering experiences of those with degrees:

*"Took part in a few bird surveys."*

*"I developed the basic skills working in the family farm by taking care of daily farming activities in general."*

*"I worked on a sheep farm which helped me understand the whole process and the necessities of timing for optimal sales. I worked on a nature reserve which made me realise how little we are doing as a society to retain and build areas for nature and diversity, and that there are not enough people with good enough understanding of the countryside to ensure it is not neglected or misused."*

Some respondents directly credit having volunteering experience with helping them secure employment:

*"Honduras for 6 weeks to study hummingbird pollination for my thesis. After Uni I volunteered with a tree planting charity where I acted as a botanist - taught myself about legislation, mapping, species identification, land management. This led to a job with an environmental consultancy." (abridged)*

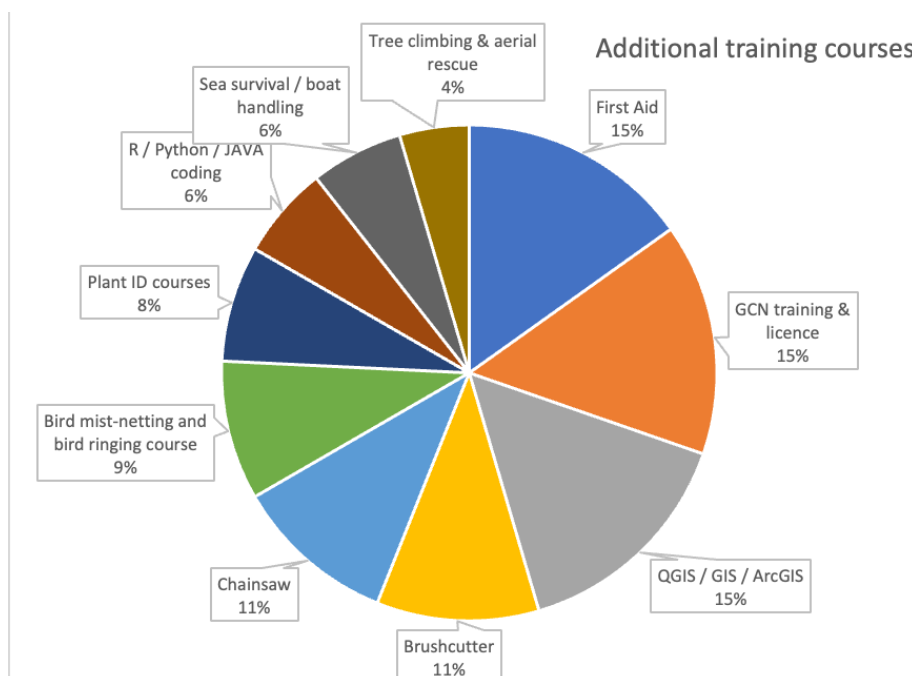
This experience contradicts the general reaction of the workshop participants who did not think volunteering abroad on the often derided 'turtle conservation' project was good preparation for working in the UK and Ireland. This perhaps suggests that the tree planting work was more helpful in securing the post. Overall, there were only four survey responses which referred to overseas voluntary fieldwork experience, and most of these had additional experience in the UK and Ireland. This may also have been impacted by the Covid travel restrictions for these cohorts.

### Graduates use of short courses and developing work related skills

The survey continued by asking about any additional training courses they might have done outside their university course, with 85% of the graduate respondents commenting that they had done so. The range of courses and experiences was very wide, covering both practical skills and knowledge related to ecology, conservation and practical land management.

The ten most prominent courses are shown in Figure 9 below. This chart covers 66% of the recorded training referred to by the respondents. First Aid is a practical requirement important for outdoor working with tools and equipment, especially on rough terrain. It could also be important for those working with the public and volunteers. A Great Crested Newt (GCN) licence was a notable and specific example of the training needed for surveying work. The prominence of technology-based learning is marked with 14% of courses taken covering GIS and coding (for data analysis). Brushcutter and chainsaw training is another important requirement for practical conservation work. The proportion of responses mentioning programming skills (Python etc.) for data analysis is worth noting.

**Figure 9 The main short courses graduates under-took**



The remaining 34% of responses covered 28 different courses, highlighting the varied requirements and contexts of the sector.



The following quotes demonstrate the breadth of training which people pursue, and certainly shows the time and funds they are spending in addition to their degrees, learning the skills they need to be employable. This raises important questions about whether new graduates should be spending this amount of their own time and money doing additional courses - should more be covered as part of their degrees? The quotes below also highlight the prominence of volunteering, integral to accessing opportunities to secure certificates and species' tickets.

*"(I did the) the GIS training with the Biological Records Centre. Then I completed a traineeship with XXX Wildlife Trust conducting habitat suitability modelling on pine martens which led me onto a job with them after six months."*

*"I did a Post Graduate University Certificate in Species Identification and Biological Recording with Manchester Metropolitan University. I also have three protected species licences: Level 2 Bat Licence, Level 1 Great Crested Newt Licence and CL29 Class Licence for Barn Owl. I am also currently training for my BTO Ringing Permit."*

*"I completed a 1-year voluntary traineeship with my local Wildlife Trust, where I completed first aid, brush cutter, chainsaw and leadership qualifications. I was able to move around different departments to gain insight into different areas within conservation. I built my practical skills in reserve maintenance, surveying, working with volunteers and project work. I also volunteer on (remote island area in UK) to broaden my knowledge to other species and habitats I may not find in my local area."*

*"I've attended numerous talks on specific species ecology e.g. butterflies, dormice, beavers, birds."*

A recurring theme of this report is the expectation that new entrants will have volunteered before applying, not only to gain experience, but also to gain equipment certificates and even species licences. A few reflected positively and reported positive experiences, as noted by this response:

*"I learnt the most whilst working as an ecologist straight after finishing my BSc in Animal Behaviour through practical field work, shadowing an experienced ecologist and having that one-on-one mentoring to gain new skills and knowledge."*

Not all the respondents were in a position to take on additional voluntary roles, or to pursue further training opportunities at their own expense. The majority of university and college students today need to undertake paid work whilst studying. This reduces any time available to volunteer. For some, the demands of studying and paid work were such that they did not feel they could take on additional volunteering or training commitments:

*"No, I needed to work."*

*"I did not (volunteer) as all my free time was used to work in order to afford to attend university."*

*"Not much as I had to work part-time."*

*"No, because the course demanded 7 days a week commitment to the modules."*

Others felt that this 'requirement' was not made clear to them during their course:

*"No, at the time it was not highlighted that this was critical to my progression."*

*"No. It was never really explained that volunteering and doing surveys outside of your course would be beneficial until it was too late. I didn't even know I could volunteer on surveys!"*

Some were sceptical and unhappy about the culture of volunteering in order to gain experience whilst studying:

*"I think volunteering is important to broaden your skills, but I think that ecology and biology base "volunteering" can often be a bit of a scam, where you are being used as free labour rather than learning much."*

Respondents to the new entrant survey comment that employers often want them to apply with their 'tickets in hand' which means they have either had to gain these elsewhere through volunteering and/or paying themselves, or through a previous employer (unlikely for most new entrants to the profession). Interesting feedback was shared on this area of training in relation to the role of large and long-term infrastructure projects:

*"HS2 and other nationally significant infrastructure projects have helped upskill hundreds of early career ecologists e.g., protected species licences, aerial tree climbing, exposure to different sites / habitats / size of building / roost types etc in a couple of years rather than the 3-5 years plus it took me." (Survey respondent)*

But for most, gaining the certificates without support becomes a barrier to securing a post because of cost and opportunity.

*"... courses are expensive and having time available to volunteer is often not an option for those who need to work to support themselves." (Survey respondent)*

## Vocational routes

For the vocationally-trained respondents, there were a small but varied set of responses in relation to developing skills through volunteering and short courses whilst at college.

One took the opportunity to develop practical skills:

*"Chainsaw- - usage and maintenance; strimming and brush cutting- usage and maintenance; operating small ride-on machinery- like lawn mower and compact tractors."*

One person volunteered whilst working rather than training:

*"I volunteer at my workplace. I did ancient and veteran surveying training then surveying of a nominated site on weekends for my workplace as a volunteer rather than a paid employee." (abridged)*

The survey went on to ask about any other training courses they might have done outside their main college course - all the vocationally trained people had examples of doing this, and nearly all the training was practical in nature, with Lantra courses featuring in these.

Specific examples include:

*"CS 30 chainsaw course; emergency First aid in the workplace; beginners basic tractor driving course."*

*"Briefly completed module on GIS, tree felling with bow saw, dry stone walling, carpentry, landscape character assessments."*

*"Froglife GCN (great crested newt) training towards a licence; bat ability webinars and several more in work, including health and safety, CSCS and ROLO."*

One respondent was bemused by the idea of volunteering whilst at college, the tone suggesting that volunteering to gain knowledge and skills whilst studying was unreasonable - would the course not provide those experiences?

*"I didn't understand the question, about doing voluntary activities at college. To my knowledge this was not an option while at XX college, and have not so far been aware of volunteering at ABC College. I didn't understand why we would be volunteering at College."*

## BOX 2 Case study: Brooksby Melton College

The College has a large campus comprising 150 acres. This helps in running real conservation projects on the ground. Currently the main activities are a river restoration project and a quarry re-wilding project. They are also running trials in regenerative agriculture and agro-forestry. The student's activities are framed around a Gantt chart which shows what tasks need to be done in order to deliver these projects. This replaces their earlier approaches to learning where students would prune trees or do an ecological survey without any context. The Gantt chart enables them to see the big picture, and also gain experience of how project management works. The approach also allows teaching of policy such as Biodiversity Net Gain and the Water Framework Directive to a vocational student group. For the river restoration - how does that align with the Water Framework Directive? What are the sources of funding that support that? What's the project design? So the level five students will be involved in the project planning the level fours could do an ecological survey report. Then the level twos might do some ground prep. But they're all working on the same project. They're just doing it a different levels. This is a highly unusual example of a VIP – vertically integrated project in a further education setting. The picture shows another example of a vertically integrated project where Level 1 students make the bug logs which are monitored by Level 3 students.



## Non graduates and those with degrees in other subjects

The same questions were asked of this relatively small group of respondents and the answers were broadly the same as for the graduates with relevant degrees and the vocationally trained:

- Practical skills training e.g., in protected species
- Machinery and equipment e.g., chainsaws and brushcutters
- Legal / regulatory requirements e.g., Health and Safety training, outdoor first aid
- Working with the public in some way

The trainees without a degree have sometimes been fortunate to have placements which offer a wide range of experiences:

*"I had a traineeship with Sussex Wildlife Trust, including chainsaw licence, brushcutter licence, tractor, 4x4 and ATV operator licences, BTO T-permit, bird species ID, Forest School Leadership qualification, Beach School Leadership."*

*"A year's placement in the conservation team at Wildwood Trust. Regular GCN surveying. Tour guide and guest expert on a bioblitz. Kent Wildlife Trust and KRAG. Surveying for ZSL. Surveying for KOS. Litter picking and habitat management. All sorts of other little bits and bobs."*

Whatever the route into the profession, we reflect that many new and recent entrants, many freshly qualified and trained, go to considerable lengths to gain new skills, knowledge and experience. This may be for using a piece of equipment necessary for their role, to gain a species licence, or a site-based certificate. We do not think there are many professions or careers for which so much is expected on a voluntary basis - the only example we can think of is the art world or fashion where people are often recruited as interns for no pay, in practices which are clearly exploitative. The degree to which the employers in the sector rely on volunteering to provide opportunities feels unethical, even if certificates and tickets are paid for. These practices have significant potential to reduce the number and diversity of people entering the profession.

## 2.2. Policy review of vocational qualifications

### 2.2.1 Qualification Levels

In England all regulated qualifications are allocated a Skill level ranging from basic skills at 'Entry Level' through numbered levels 1 to 8.

Level 1 qualifications are equivalent to GCSE grades D to G or 3 to 1

Level 2 qualifications are equivalent to GCSE grades A\* to C or 9 to 4

Level 3 qualifications are equivalent to A Level / AS Level and International Baccalaureate Diploma

In the Higher Education Sector academic qualifications are ranked at levels 4 and above

Level 4 qualifications include Certificate of Higher Education

(content level equivalent to first year undergraduate programmes, 120 credits)

Level 5 qualifications include Diploma of Higher Education

(content level equivalent to second year undergraduate programmes, 240 credits)

Level 6 Bachelor's Degree

Level 7 Master's Degree

Level 8 Doctorate awards and other high-level Diplomas, Certificates and Awards.

### 2.2.2 Academic qualifications relating to Ecology and Environmental Science

GCSE and A Level / AS Level qualifications are provided by exam boards that set and mark examinations and allocate qualifications to students. The Boards are regulated by Ofqual (Office of Qualifications and Examinations Regulation), a non-ministerial UK government department. Ofqual is independent of government and reports directly to Parliament.

**At Levels 1 and 2** Ecology is contained within the broader syllabus of GCSE Biology and GCSE Combined Science. Environmental Science is also available at Levels 1 and 2 as a topic within the 'Environmental and Land-based Science' GCSE course offered by the OCR exam board. In England, as part of the Government's Sustainability and Climate Change Strategy, a new Natural History GCSE was announced. Due to start in 2025 the syllabus includes 'organisms and environments; environmental and sustainability issues'.

**At Level 3** proposals to introduce AS and A Level Environmental Science came in a 2015 consultation paper from Ofqual. This document included details of 'Subject level conditions, requirements and guidance' with a proposed start date for courses in 2017. An Environmental Science A Level was launched that year by the AQA exam board and is currently available.

**At Levels 4 and 5** there are certificate and diploma courses available. The Open University, for example, offers a Certificate of Higher Education in Environment and a Diploma of Higher Education in Environmental Science as distance learning courses.

**Level 6** undergraduate degrees are offered by universities and a range of other institutions. The UCAS website (Universities and Colleges Admissions Service) shows 887 Environmental Science degrees offered by 105 providers for 2023. This figure is somewhat inflated because it counts variations of the same course, such as with or without a study year abroad. Unlike lower level qualifications and many vocational courses universities are self-regulating in terms of the range of courses they choose to offer and the content of each degree programme. There are obvious financial and resourcing constraints but each degree will differ.

Regulation is by internal procedures and is overseen at the individual course level by external examiners. The Higher Education sector is overseen by the Office for Students, an independent public body, not part of central Government, that reports to Parliament through the Department for Education. This looks at the university's processes to evaluate standards and is not involved with individual Ecology and Environmental Science courses. There are also subject benchmarks set by the QAA (The Quality Assurance Agency for Higher Education), an independent charity whose work is accepted internationally by governments and funding bodies. Their Subject Benchmark Statements describe the nature of study and the academic standards expected of graduates in specific subject areas. Reviews of these Benchmarks give an opportunity for strategic input by professional bodies such as CIEEM to influence the subject content of courses. This gives a wider impact than negotiating with individual universities. Ecology is included in the QAA Benchmark for Earth Sciences, Environmental Sciences and Environmental Studies. Other Benchmarks where courses may have aspects of ecology are Biosciences; Geography; and Agriculture Horticulture Forestry (currently under review 2023-2024).

Also at Level 6 are specific courses for Ecologists as well as more general Environment degrees. For 2023 there are 380 undergraduate Ecology degree courses from 70 providers listed by UCAS. Some broader degrees such as Biology also offer the option to specialise in Wildlife or Conservation.

**At Levels 7 and 8** postgraduate courses offer a further range of qualifications. The longest are research programmes leading to PhDs at 8. Masters degrees are Level 7 and Post Graduate Diplomas can be Level 7 or 8. These courses are usually one year taught programmes with some research content. Postgraduate courses are regulated internally, by the university's Postgraduate Degree Regulations, allowing a wide range of course content. In 2014 the QAA provided a national Framework of Higher Education Qualifications which provided a context for the internal university postgraduate regulation process. In July 2022 the QAA on behalf of the UK Standing Committee for Quality Assessment (UKSCQA) began a consultation with the Higher Education sector to review the future scope and structure of the Quality Code so this area of regulation is likely to change. One trend has been increasing expectations of employer engagement in this process. In some cases, postgraduate programmes will be moderated to reach the accreditation standards of external professional bodies such as The Institute of Environmental Management and Assessment (IEMA). For example, an MSc Sustainability and Environmental Management course at the University of Derby was developed in partnership with IEMA. CIEEM accredit seven MSc programmes. It is worth noting that currently certification by CIEEM does not carry the same recognition as professional body recognition does in other sectors. In some professions (e.g. medicine) it is impossible to practice without it. In others e.g. planning it is expected in the public and private sector, but there is still the potential to work without it. For ecologists, CIEEM membership and professional accreditation is one factor alongside others in the job and recruitment process. Raising the status of the ecology profession is a key reason CIEEM was created, and the importance of professional recognition should increase over time from CIEEM's work.

Some taught postgraduate courses in ecology may be designed for students who have completed a degree in a related subject such as Geography. These provide an overview of Ecology and the opportunity to gain practical experience in the skills needed by ecology professionals. Oxford Brookes University, for example, offers a Conservation Ecology MSc or PGDip or PGCert. Liverpool Hope University combines Ecology and Environmental Management in a CIEEM accredited MSc. Other courses offer advanced courses for specialist topics within Ecology such as the Statistical Ecology PGDip at the University of St Andrews, or the Postgraduate Certificate in Ecological Survey Techniques at the University of Oxford Department for Continuing Education. Manchester Metropolitan University offers a Biological Recording postgraduate certificate. These university based high level courses fulfil a useful role in providing content that undergraduates mention as insufficient or absent in this report such as Species identification, Ecological surveys and Statistics. They do raise some questions about their accessibility to students from vocational rather than undergraduate academic backgrounds. Some respondents in the survey section of this report were concerned about overly theoretical and academic class-based learning environments that are not supported by sufficient field work and the acquisition of practical skills.

### 2.2.3 Vocational and Technical Qualifications

Alongside these academic qualifications are a wide variety of alternative educational awards. Changes to recent Government policy in England have resulted in a major investment in the new T Level qualification. Originally conceived as vocational qualifications they now include generic subjects such as Science. There is a Government expectation that 'T Levels will become one of the main choices for students after GCSEs' alongside A Levels, Apprenticeships and other specialist qualifications not served by A Levels and T Levels. This has implications for the future of long-established vocational certificates and diplomas including Level 3 BTECs. They also raise questions about the purpose of other Level 3 qualifications such as NVQs.

**National Vocational Qualifications (NVQ)** qualifications were intended to provide a wide range of work-based study programmes. Introduced in 1986 with the purpose of validating skills for a job or career path they became a major component of the British educational framework. NVQs have been offered from Levels 1 to 7 and were designed to be flexible with no time limit for completion. Courses may be taught in schools, colleges, the workplace, or online. They are regulated by Ofqual. Environmental examples include NVQ Managing Environmental Resources Level 3 Course; and NVQ Developing Environmental Awareness QCF Level 2.



**T Levels** are new two-year courses at Level 3. They can be taken in a school or college context after GCSEs and are generally equivalent to three A Levels. They combine practical and knowledge-based study in an academic environment with work experience through a minimum of 315 hours (45 days) in an industry placement. Since their 2020 launch, 16 courses have been become available, with plans to increase this to 24. This initiative from the Department for Education in England has the policy aims of ‘streamlining and improving the quality of the post-16 Level 3 qualifications system. We are strengthening progression pathways, creating clearly defined academic and technical routes with high quality qualifications leading to further study, and/or skilled employment’. T Levels are developed by providers, working together employers and supported by the DfE. T Level panels develop the content for the technical qualifications which are part of each T Level using the same standards as Apprenticeships approved by the Institute for Apprenticeships and Technical Education. On completion students receive a nationally recognised certificate for the T Level at one of four grades (pass, merit, distinction and distinction\*) together with a breakdown showing component grades. These grades can be matched to A Level equivalent and UCAS tariff points for entry into Higher Education. Ofsted (Office for Standards in Education, Children’s Services and Skills) published an interim report that evaluated the quality of T Level courses in 2020 and will publish a full report after inspection visits in 2023.

Current T levels do not specialise in Ecology or Environmental Science. There is ‘Agriculture, Land Management and Production’ which prepares students for careers in land occupations such as farming or forestry; and the more specialist ‘Tree and Woodland Management and Maintenance’. Despite being new qualifications, the content is not necessarily new in T Levels, in some case drawing heavily on previous qualifications they replace, BTECs and similar, rather than looking at what skills are needed now and in the future. The current range of T Levels is very mixed, appearing to be dependent on a provider or an industry driving new course development rather than an overall strategy. The health sector, for example, has been involved from an early stage, with two T Levels starting in 2021. While not immediately relevant T Levels are a concern in terms of the major policy initiative and funding supporting their development. Existing vocational courses could be affected by the ‘streamlining’, either removed entirely or be affected by alterations to supporting elements of the education framework. There are also financial implications. A defunding of qualifications which overlap with T Levels or A Levels is a possible consequence following the Education and Skills Funding Agency 2019 announcement of a “moratorium” on approving funding for new qualifications at Level 3. As well as their place in the school curriculum, Level 3 qualifications are important for adults wishing to update their knowledge, gain new skills, or progress on their career path. Jennifer Coupland, chief executive of the Institute for Apprenticeships and Technical Education emphasised that Level 3 had this ‘important role for people at the start of their careers and those looking to build new skills.’ Participation by ecologists and their professional bodies in decisions made about future T Levels in this field could influence events, alongside arguing special cases for the continuation of existing Level 3 and 4 courses. A Habitat Management course at T Level has been discussed but the review period was extended. Few of our participants had direct experience of T Levels. A content specialist in countryside and environment who worked for two accrediting organisations commented:

*“T levels are a disaster in the making.... they need some ridiculous amount of (work placement) hours as well. So the employers haven’t got time to mess about having all these placement people.... I don’t know, anybody who thinks T levels are a good idea. That just mild.”*

Finding employers willing to host 17 and 18 year olds will be challenging for all education providers of T Levels. These are likely to be more intense in parts of the country with fewer such specialist employers, and colleges in more rural parts of the UK, outside the south-east are less likely to offer them.

**Apprenticeships.** Alongside the new policies enabling T Levels there have been strategic changes to the apprenticeship sector. They are differentiated from T Levels by having a balance of 80% on the job and 20% of time spent on study and take longer to complete if continued to the higher levels. While T Levels now aim to prepare students for a range of outcomes (starting work; continuing further vocational training, progressing into Higher Education) Apprenticeships are work oriented. They are designed to suit those who wish to earn a wage at the same time as learning and participants can begin work at the age of 16. A new system began in 2014 to replace the previous apprenticeship frameworks with Standards. Content and standards are set by ‘Trailblazer’ groups representing employers and sector organisations. The Institute for Apprenticeships and Technical Information (IfATE) was established in 2016 as the regulator for this sector with the aim of ensuring the quality standards of apprenticeships and providing government with advice on the funding for each Standard. IfATE is an executive non-departmental public body sponsored by the Department for Education and it began operation in 2017. Its role was extended to include T Levels in 2019 and could be further expanded to cover all technical education. The Apprenticeship scheme is supported financially by a new apprenticeship levy, introduced in April 2017, paid by all UK employers with a pay bill of over £3 million per year. Since April 2021 all apprenticeships have been managed through the Apprenticeship Service in areas such as finance and recruitment.

Apprenticeships are designated into four categories to match recognised qualification levels:

<b>Intermediate</b>	Level 2 five GCSE passes
<b>Advanced</b>	Level 3 two A level passes
<b>Higher</b>	4,5,6 and 7 Foundation degree and higher
<b>Degree</b>	6 and 7 Bachelors or Masters degree

End point assessment is complex. Standards regulation is at individual student rather than course level. It requires external regulatory involvement in assigning the overall grade to a student's apprenticeship; a separate rating for the core topic; and further component grades.

Numbers of apprenticeships are increasing, both in participants and the range of career options offered. In September 2022 there were 800 different apprenticeships available to anyone over the age of 16. Government statistics for apprenticeships from August to January 2022/23 show 195,600 starts, total participation as 636,960, and 62,030 completions. There is some evidence of a shift from low levels to higher academic ones. With no upper age limits these apprenticeships offer educational opportunities at a range of career levels. In this set of statistics under 19s only accounted for 28.4% of starts. Starts at Level 6 and 7 increased by 11.1% to form 15% of the total.

Ecology and Environmental Science careers are under-represented in comparison with other areas. A 2019 listing from the National Apprenticeship Service has only a single entry for the environment sector, Environmental Conservation at level 2 and 3. Other sectors have a range of specialist options with the health services providing over 50 apprenticeships. This is perhaps a reflection of historical employment patterns in Ecology. There was not extensive use of apprenticeships to boost the workforce skills as in the health sector so there was not a carry-over from the old apprenticeship framework into the new Standards based system. Entry into Ecology sector has focused on academic degree level qualification for entry and conservation in general has had volunteers supplementing its workforce rather than paid apprentices.

Apprenticeships are an option for ecologists under the Standards scheme. Professional bodies such as the Society for the Environment and CIEEM participated in the development of the first, a Level 6 Environmental Practitioner Apprenticeship, which was offered in 2019. CIEEM lists six participating universities. CIEEM has also supported the development of a Level 4 Countryside Ranger Apprenticeship and a Level 7 Ecologist Apprenticeship. The Level 4 Apprenticeship has been launched by organisations such as the National Trust, RSPB and Natural England. The Level 7 is an MSc degree with entry requirements of an upper second degree or equivalent and typically takes 2 years to complete.

Generic issues with Apprenticeships include poor completion rates, difficulty in changing/updating course content and regulatory issues particularly in university settings. A degree level apprenticeship could take six years and presume both the workplace situation and the individual's circumstances are stable. This could lead to failure if employers closedown or reorient their businesses. It also increases the chances of non-completion due to issues such as family circumstances and finances when study is spread over such a long period. Regulation by Ofsted in a university can create problems for a participating university as Ofsted ratings are applied to the whole institution and the apprenticeship will only be a very small element of that university's teaching. Problems with degree level apprenticeships, such as a high drop-out rate, could lead to a low rating for the institution as a whole impacting on its funding and reputation.

The greatest concern for this study is the ability to update their content to reflect current and emerging policy and practice. This view is widespread including an experienced FE tutor who used to work as a consultant ecologist:

*"We're working from a spec, which was written in 2019. And a lot of things like the Agriculture Act, and the Environment Act didn't exist. And certainly, new methodologies like UKHab and things like that didn't exist.. And that's sort of frozen in time."*

A researcher who specialised in vocational work-based learning commented:

*"I was talking to an apprenticeship provider yesterday. And he just said, 'The problem is that we're teaching people, none of its modern or contemporary. It's all not taking into account the influence of AI or anything like that. That they'll all come out with redundant skills at this rate.'"*

This view was further endorsed by a content specialist in countryside and environment who worked for two vocational accrediting organisations.

*"So the chances of changing an existing one are absolutely zero, right? Even putting in a unit and saying, could we put this as a an extra unit? Could we put this as a pathway through? It's the time and money and Ofqual don't like altering what they've said. .... it takes much longer to write an FE qualification than it does an HE qualification, loads more, and it has to get signed off by Ofqual in order to get the funding."*

Only a small number of our workshop participants had direct experience of apprenticeships, but these comments were endorsed by two participants.

*“Apprenticeships have to be future proofed but how can we do that if the building blocks of the system are about what happens currently in a job?”*

*“We need apprenticeships to be reviewed on a continual basis.”*

## 2.2.4 Vocational Certificates and Diplomas.

The vocational sector includes thousands of courses ranging from very specialised short courses such as Lantra’s Felling and Processing Trees SCQF Level 5 short course to full time HNC/HND environmental science programmes lasting up to 2 years. Schools, sixth form colleges and FE Institutions are major providers but there are many other options. Independent awarding bodies such as City and Guilds can be responsible for course design, standards of delivery and assessment. Some courses receive financial support from the Department for Education, others run on a commercial basis. LICQual, for example offer Level 4, 5 and 6 Diploma courses in Environmental Management. LICQual, is a limited company based in the UK but operating as an international awarding body. It defines the syllabus and learning outcomes; specifies the course structure in terms of modules, credits and hours of study; and provides assessment criteria.

At Level 3 there are currently four types of qualification at this level – A Levels, new T Levels, BTECs and City and Guilds. In England the Government is planning to defund any qualification that overlaps with A Levels and new T Levels. This impacts on the 30% of 16–18-year-olds who currently undertake at least one BTEC qualification.

Higher National Certificates and Diplomas qualifications such as BTEC courses have been a major element of vocational training in the UK. An HNC is a Level 4 Qualification and takes one year if studied full time. HNDs are Level 5 and take two years to complete full time. They have been used as career entry pathways and for continuing education provide a method of updating and diversifying skills. BTEC level 3 Certificates give basic grounding in a vocational subject and an entry point to higher level study. Many of these courses are well established having run for long periods and been delivered by many providers but may now need adjusting to meet new education policy requirements. A BTEC Nationals Environmental Sustainability course has been offered by Pearson from 2010 to 2023. Pearson, an independent awards body, has now teamed-up with Lantra to offer six courses at Level 3 Nationals. Lantra is a registered charity and award body for UK and Ireland land-based industries.

Professional bodies and independent awarding providers have the advantage of flexibility in updating their course material and adapting to broader changes in their sector. Some offer tailored one off courses to a particular employer or specialist student group. Responding to the rapid changes in many professions can be a problem if there is a top-down approach to programme content that gives very detailed requirements for the contents of a course with no local flexibility and no a rapid central review process.

## Forestry case study

Forestry provides a case study and model for other environmental specialisms by identifying and mapping its professional skills into an education framework.



The Institute of Chartered Foresters provide an initial statement to promote the industry for both recruitment and to raise the profile of their industry with government.

*“Trees play a critical role in global efforts to combat climate change by sequestering carbon which stays locked up for hundreds of years. Timber and other wood products are not only used widely in construction, but are found in goods we all use daily in our lives. Governments across the UK have set ambitious tree planting targets but we need an expanded, skilled workforce to achieve them. Careers in forestry and arboriculture are exciting and varied. It is a high-tech sector that is brimming with opportunity.”*

Routes into the Forestry Sector offer a wide range of entry levels via universities, colleges and apprenticeships. The devolution of education within the UK has led to a divergence in policy and regulation. This requires professions to negotiate these differing requirements to support their courses and avoid a regional lack of educational opportunities. In the Forestry sector University level entry and College courses are available in England, Scotland and Wales. Apprenticeships are running in England and Wales.

## University level

Level 5, 6 and 7 programmes are offered in six institutions and include a choice of five bachelor's degrees. Postgraduate level study is offered at three institutions including a masters level course in Environmental and forest management at the University of Aberdeen. There are opportunities to enter at foundation level and at Bangor University there are distance learning options.

## College level

Excluding short courses, the forestry sector has 48 courses available in England offering awards at the full range of levels. Colleges offer courses such as Introduction to Arboriculture at Level 1, leading into Arboriculture levels 1,2 and 3. Various regulatory bodies are included such as City and Guilds level 1, 2 and 3 certificates and diplomas. These are generally giving broad subject coverage of Forestry, Arboriculture and Land Management. In Scotland there are nine college-based courses mainly based in the Scottish School of Forestry and include SCQF levels from 5 to 8. For example, Arboriculture and Urban Forestry is an HNC SCQF level 7. Wales has a provision of 6 courses with some forestry content in levels 2 and 3. These award-based programmes run alongside an extensive provision of specialist short courses, often practical skills training in machinery such as chainsaws or techniques such as tree felling, Aerial tree rigging, and carrying out tree inspections.

## Apprenticeships

Forestry related apprenticeships have been set up from levels 2 to 6:

Level 2 Arborist

Level 3 Forest Craftsperson

Level 4 Arboriculturist

Level 6 (degree level) Professional Forester

Level 6 (degree level) Professional Arboriculturist

The Forestry Commission are using the Apprenticeship Levy to fund their Development Woodland Officer programme. This is jointly led by The Forestry Commission, the University of Cumbria and the Institute of Chartered Foresters and is integrated into both academic and professional award structures. It leads to a Professional Forester Apprenticeship (equivalent to Level 6), a BSc (Hons) Professional Forester and Chartered Forester status with the Institute of Chartered Foresters. This is integrated so that the individuals involved are assessed once, and not three times for broadly the same skills. The professional body also waives the registration fee and joining fee for these entrants.



## 2.3 Recruitment processes

This section draws on data from several sources: a large data set of job advertisements provided by the Environment Job recruitment site; responses to our survey about experiences of recruitment from those newly entered into the profession; and observations from the focus groups and interviews.

### 2.3.1 Recruiting graduates

Overall, this is the preferred approach for most organisations interviewed but with the caveat that graduates often lack the skills they need to be effective immediately. Some organisations spoke about the need to sometimes recruit only graduates for specialist roles. In Ireland, where the capacity issue appears to be the most acute, organisations are having to work harder than their counterparts in England, Scotland and Wales – they are doing whatever they can to bring more people into the profession:

*“We are going to all universities giving lectures and seminars, offering bursaries, placements, graduate recruitment programmes – we are working hard to find people who we can bring into the profession.”  
(Interview with consultancy, Ireland)*

Is there learning here for organisations across the sector? Clearly, there are time and cost implications, but could cross-sectoral partnerships support each other to ‘bring the supply to life’?

### 2.3.2 Recruiting people with vocational qualifications

Some organisations relate a willingness to do this more, with one organisation trying to take a dual approach driven by the need to make opportunities in the sector more accessible to people with little or no tertiary education. Overall, the recruitment of vocationally qualified people is more the exception than the rule.

*“We are looking at apprenticeships at a higher level but there is no policy of this.” (Interview with regulator)*

All participants in this research report problems with recruiting enough people with the right skills to fill their current vacancies. The situation in Ireland illustrates the wider situation:

*“Over 80% of (report respondents) could not fill all of the vacancies they advertised, with 50% having 7+ positions still vacant in their company. All but one respondent said they have had to turn down work opportunities due to an inability to fill ecological vacancies.”<sup>28</sup>*

There were no comparable figures for England, Scotland and Wales and so the scale of the problem remains unquantified, but all parts of the ecology sector report similar scenarios.

*“We had to re-advertise a post for a nature reserve manager as we could not get candidates with enough experience to take on the role.” NGO, England*

This sets the context for recruitment to the sector - demand very much exceeds supply - but the experience of people applying for their first job highlights a wide range of problems which the sector itself creates.

We were given access to two years of job adverts placed on Environment Jobs. We analysed the main aspects of the job adverts and then looked in more detail at the job description to better understand what employers expected and what they offered in return. The headline conclusions were as follows:

1. In many cases, employers’ requirements ‘self-limited’ the field of potential candidates i.e., the pay, qualifications, contract arrangements, training and working conditions reduced the field to those with sufficient financial support to be able to afford the role. The cohort of those who were unable to make a realistic application remained invisible - the employers saw only those who had what was asked for.



2. Only a small proportion (less than 2%) of advertised roles mention vocational qualifications e.g., NVQs, HNDs, BTECs etc. The proportion of adverts asking for 'degrees or equivalent' is higher at c10%, but the meaning of this wording is unclear - did that mean experience or vocational qualifications, or both?
3. If you had a vocational qualification, you would be offered on average a salary £1,300 pa less than that for a graduate in the same role.
4. Having previous experience is mentioned in the majority of job descriptions which, for new and recent entrants, meant experience gained through volunteering. The survey respondents commented on this at length and with feeling.
5. The most common requirement was to have a full and valid UK driving licence and to own or have access to a car. The proportion requiring a licence was 34% and a further 10% stated that applicants 'need to be able to travel' or a company car was provided (and so having a driving licence is a reasonable assumption).

Whatever the reasons behind the employers' requirements, the impact in aggregate of these factors served to reduce the pool of eligible candidates, running counter to the aim of making the ecology workforce more diverse. For example, in relation to requiring a car and licence, whilst 75% of white people have a driving licence, only 50% of black people do<sup>24</sup>. The requirement for a car was understandable for many roles but it assumes that the candidate could afford to learn to drive, to buy a car, or had access to someone else's car, and that they could afford the insurance and running costs.

*"I think a lot of roles are restricted by not being able to drive. A lot of friends have been turned down due to this." (New / recent entrant survey)*

As an example, one job advert, paying £18,534 pa, required the following:

*"You must have experience of recruiting and working with volunteers, delivering conservation projects within communities, as well as having a current UK driving licence and have access to your own vehicle." (Environment Job data)*

The requirement for a driving licence was also highlighted by a CIEEM intern paper<sup>25</sup>, along with a range of other requirements from a small sample of nine entry level roles. We have selected the requirements which were harder for new entrants to provide, ignoring the more reasonable requirements e.g., 'report writing skills':

- Eight out of nine job adverts wanted a full driving licence
- Three of the roles wanted CIEEM membership
- Six out of nine of the roles wanted the candidate to have or be working towards a protected species licence
- Two wanted the candidate to hold a CSCS card
- At least three years of survey experience required for one role

To be affordable, the more remote conservation and surveying jobs were only practical if candidates lived relatively close to the work locations, which again raises questions about the viability of the roles for many candidates. Given the low wages, the candidates would likely have had to rely on a car and accommodation paid for by parents or a partner. The sector may argue that it has limited scope to address these problems, but these factors which make it harder to recruit suitable candidates.

Generally, a CSCS card could be simpler and can be done online, but ecologists require a higher level specified as 'Ecology and Environmental Management Skilled Worker Blue'.

*"To obtain this SmartCard you need to achieve ROLO Operative Health, Safety and Environmental Awareness Course, CITB Operative Touch Screen Test and hold a relevant licence(s) with the appropriate licensing authorities in England, Scotland, Wales and Northern Ireland."<sup>26</sup>*

The relevant training and qualifications must've been completed within two years of applying for the SmartCard and lasts for five years. Whilst this is not hugely onerous, it is another licence requirement to maintain.

24 <https://www.ethnicity-facts-figures.service.gov.uk/culture-and-community/transport/driving-licences/latest>

25 'What are the main difficulties in gaining employment in the ecology sector?' Anouska Laramy, 2020

26 BALI SmartCards - <https://www.bali.org.uk/lisscscs-2019/smartcards/ecology-and-environmental-management-skilled-worker-blue/>

In addition, gaining species licences takes time and the candidates need the opportunity to gain the relevant experience. Gaining three years of survey experience without employment significantly narrows the field of potential candidates. CIEEM student membership is £28 pa; full membership is £202 in Great Britain but with entry criteria - these are lesser barriers to entry which perhaps employers could meet the cost of, as is common in other sectors e.g. planning

To illustrate the requirements and rewards which come with a typical new entrant post, we have constructed a 'sketch' for a role which brings the typical characteristics together, based on the data analysis of the new entrant posts.

### The typical new entrant to ecology employment package

You will be a graduate and required to work full-time with a 50/50 chance of being on a permanent or fixed-term contract, with a higher than two in three chance of working in a conservation-related role. There's a chance that you could be asked to work evenings and weekends.

You will be paid £23,553 a year which is just £1,880 higher than the annual full time minimum wage, assuming you are 23 or above. If you want better pay, move to Scotland for an extra £500 pa. This is still lower than the average UK graduate starting salary of £24,291<sup>27</sup>.

You will be required to have a full driving licence and to own or have the use of a car which is insured for business use (although the adverts do not mention this). You will need this to work in remote areas. You will be paid a mileage allowance but you are very unlikely to be offered a company vehicle (1.4% of roles offered this).

You may be offered in-job training e.g., for equipment and species' tickets, but there is unlikely to be any structured, longer-term training or development. You have a 50% chance of needing to look for a new job at the end of the survey season.

It's interesting to compare the average starting salary of an ecologist (typically a graduate) with that of other professionals, either in unrelated fields with national pay scales, or related areas - ecologists may work quite often alongside civil engineers and surveyors, but have a starting salary which is £7,000 pa lower.

**Table 2. Mean average starting salary for ecology compared to other professions**

Profession	Starting salary
Ecologist (no national pay scale)	£23,553 <sup>28</sup>
Teacher	£30,000 <sup>29</sup>
Nurse	£28,407 <sup>30</sup> £26,300 for graduate management trainee
Police Officer	£19,164 <sup>31</sup> when training; £ 21,402 after 14 weeks training £26,550 for graduate trainee programme
Firefighter	£27,178 <sup>32</sup>
Civil engineer (no national pay scale)	£31,098 <sup>33</sup>
Graduate surveyor (no national pay scale)	£30,635 <sup>34</sup>

The public sector roles often have a good pension and set annual progression e.g., a police constable may start on a lower salary than an ecologist but will be on a higher salary after a year of £24,780 pa and on a much higher salary after seven

27 <https://thinkstudent.co.uk/average-graduate-salaries-in-the-uk, 2022>  
 28 Analysis of job adverts for new entrant / starting positions from June 2021 to June 2023, Environmentjob.com  
 29 <https://getintoteaching.education.gov.uk/salaries-and-benefits>  
 30 <https://www.prospects.ac.uk/job-profiles/adult-nurse>  
 31 <https://www.jointhecops.co.uk/uk-police-officer-salary/#constable>  
 32 <https://www.fbu.org.uk/pay-rates/pay-settlement-2023>  
 33 [https://www.glassdoor.co.uk/Salaries/graduate-civil-engineer-salary-SRCH\\_K00,23.htm](https://www.glassdoor.co.uk/Salaries/graduate-civil-engineer-salary-SRCH_K00,23.htm)  
 34 [https://www.glassdoor.co.uk/Salaries/london-graduate-surveyor-salary-SRCH\\_IL,0,6\\_IM1035\\_K07,24.htm](https://www.glassdoor.co.uk/Salaries/london-graduate-surveyor-salary-SRCH_IL,0,6_IM1035_K07,24.htm)

years of up to £41,130<sup>35</sup>. Of course, there are marked differences between these roles, but in general ecology posts compete poorly on pay and conditions. The sector relies on people having a strong desire and passion for working with and for nature, but if not enough people are entering the profession, perhaps this is no longer enough?

Perhaps a better comparison is with other science-based careers in and around biology which careers in ecology might compete with more directly. Employment areas include food production, genetics and medicine. Indeed.com lists nine biology-related disciplines<sup>36</sup>, including ecology:

- Anatomy
- Histology
- Ecology
- Physiology
- Biochemistry
- Botany
- Genetics
- Microbiology
- Zoology

Pay and conditions vary widely but the following table gives a broad overview of what a starting or typical salary might be for careers in these science disciplines.

**Table 3. Starting / typical salary for ecologists and other scientific professions**

Biology-related graduate careers	Starting / typical salary <sup>37</sup>
Ecologist (no national pay scale)	£23,553 <sup>38</sup>
Anatomy - forensic scientist	£23,346 to £ 37,000 <sup>39</sup>
Biomedical scientist (NHS)	£25,655 <sup>40</sup>
Histology Technician	£20,000 (apprentice) <sup>41</sup> £25,000 (qualified)
Clinical Physiologist	£24,907 starting salary £32,456 average salary <sup>42</sup>
Biochemist	£24,000 starting salary (can be nearer £30,000) £50,000 experienced <sup>43</sup>
Clinical Geneticist	£29,384, rising to £40,000; £114,000 as a consultant <sup>44</sup>
Microbiologist	£25,000 starting salary £36,000 average <sup>45</sup>

35 <https://www.jointhecops.co.uk/uk-police-officer-salary/#constable>

36 <https://uk.indeed.com/career-advice/finding-a-job/how-to-become-a-biologist>

37 *ibid.*

38 Analysis of job adverts for new entrant / starting positions from June 2021 to June 2023, Environmentjob.com

39 <https://uk.indeed.com/career/forensic-scientist/salaries>

40 <https://www.prospects.ac.uk/job-profiles/biomedical-scientist>

41 <https://uk.indeed.com/q-histology-technician-l-england-jobs.html?vjk=7de6b50058762471>

42 <https://uk.indeed.com/career-advice/finding-a-job/what-is-a-physiologist>

43 <https://nationalcareers.service.gov.uk/job-profiles/biochemist>

44 <https://www.healthcareers.nhs.uk/explore-roles/doctors/roles-doctors/medicine/clinical-genetics>

45 [https://www.glassdoor.co.uk/Salaries/london-microbiologist-salary-SRCH\\_L.0,6\\_IM1035\\_K07,21.htm](https://www.glassdoor.co.uk/Salaries/london-microbiologist-salary-SRCH_L.0,6_IM1035_K07,21.htm)

Zoology	£18,000 starting salary (unclear why this is below NLW and a degree is also required) £23,000 average <sup>46</sup>
Overall range	£25,400 starting £34,300 average (some roles can be paid significantly more than this)

Note that the general employability advice for most of these careers mention completing a placement as part of a degree, organising summer placements and / or gaining experience through an internship. There was no mention of volunteering other than for zoology roles.

Some parts of the sector, typically private sector consultancies, were trying to make the roles more attractive by offering:

- Working from home and hybrid working
- Company vehicles, perhaps on a lease arrangement
- A mobile phone
- Membership of healthcare schemes
- Cash incentives

Anecdotally, the perception in the sector is that publicly funded roles in agencies and regulators compete well on pay and conditions (pension arrangements will typically be better) with private sector organisations, and the larger, national NGOs perhaps competing on a par with them. Likewise, the perception is that the smaller and regional NGOs struggle to match the pay and conditions of most other organisations in the sector.

Based on the job data for new entrants, there is little difference in pay between full-time roles across the different types of employer. Natural England, apparently, offered the lowest pay for new entrants. Local Authorities pay significantly more for new entrant roles and the jobs were slightly more likely to be permanent versus fixed-term (54% vs 46%).

**Table 4. Number of full-time posts and average salary by employer type**

Type of employer / role (full time only)	Number of posts	Average salary (where detailed)
All new entrant roles	2,162	£ 23,294
Conservation, all employers	1,469	£ 23,156
RSPB	194	£ 23,150
Wildlife Trusts	175	£ 23,156
The National Trust	26	£ 22,400
Natural England	9	£ 20,895
National Parks (seven)	37	£ 22,220
Local Authorities (31)	51	£ 25,176

Salaries need to be competitive with good employment conditions to attract and retain people. The overall analysis and the recruitment experience of employers suggests that wages and benefits are insufficient to achieve this. This is also the experience of the new and recent entrants to the profession.

*“Many entry level roles rely on zero hours contracts, particularly consultancy posts with larger firms. I found this to be a difficult factor to overcome and believe it could pose a barrier to entry for some early career ecologists.” (New entrant survey response)*

46 <https://universitycompare.com/guides/career/zoologist>

There were examples of full time, non-apprenticeship jobs advertising pay well below the national minimum wage. There were examples in the interviews of people who qualified before tuition fees and maintenance grants were in place who feel 'the struggle' is part of the process of proving your dedication to ecology and conservation. Passion and interest as motivating factors definitely have their place, but if you cannot recruit the people you need, the labour market is telling you something.

The survey we conducted of new and recent entrants to the sector reinforces the sense that, frankly, the sector is not doing enough to attract and retain people who appear to have a genuine interest in nature. We asked the survey respondents whether there was anything they wanted to say about their experience of applying for ecology roles and here are some sample responses which illustrate the general tone of the responses. We've included more and longer quotes than usual at this point to reflect the strength of feeling - there were many heart-felt responses in this part of the survey.

*"There would be more people in the sector if the hours and pay were fair and if employers were more willing to supply supported, on the job training."*

*"I've had to do a huge amount of free work and would not be able to do this without the support of my family - which prevents many people from getting jobs in the field and needs to change."*

*"Not everyone is in the financial position to volunteer. Companies need to seriously consider what they are asking when they are requiring newly graduated people to have 2 years experience."*

The seasonal nature of many early-career positions is well known, but what does the experience of many new career entrants do for the reputation of the sector in a competitive jobs market? Do many in more senior ecologist positions think that because they had to do this, the next generation should do the same - can the sector afford to make it this hard to get a start?

*"I think I was lucky, I started work as an ecologist straight out of my BSc degree because of family contacts. I have known others who have really struggled getting a full time job or have been taken advantage of with either being unpaid to do work (only offered volunteering roles), or only used during survey season and then let go at the end of survey season where they have been overworked and underpaid. It is well known that the ecology sector takes advantage of young graduates who have little work experience."*

*"Volunteering shouldn't be necessary on top of a degree to get a job, it is discrimination against poor income applicants and also disabled people, although it is the norm. Volunteering and short courses should equally be accepted in place of a degree as you learn more applied knowledge, and are more open to lower income applications."*

*"My overall experience in applying for jobs has been horrendous, with no acknowledgement of applications submitted, no response to emails sent, and being discounted for not having the right degree grade."*

*"The demands for volunteering experience to get graduate and assistant positions is a cancer on the sector."*

It seems also that nepotism plays a role for some in securing jobs, a situation not lost on some other respondents:

*"So far, I have not yet had to formally apply for my ecology roles because I have known the right people."*

*"The sector is very elitist and not always attainable for lower class / working class people."*

*"It was very difficult to get an interview because I had no contacts in the field. It seems like you have to be recommended for an interview by someone already working at the company."*

The experience of some respondents seems to contradict the assertion that there are not enough newly trained people to go around. The following quote also highlights a potential unintended consequence of the volunteering culture - blocking qualified candidates from securing a post. What does the reliance on gaining voluntary experience tell us about the sector and the formal training offered to new ecologists?

*"It is incredibly hard to secure an interview, there is a lot of competition and sometimes you don't apply because you assume the job will have too many applicants and volunteers going for the role."*

We can only speculate as to how the following person supported themselves whilst volunteering seven days a week:

*"It's extremely rewarding when you get a role, however to get one is very difficult. I had a degree, 1 year traineeship with a conservation charity and 6 months as an assistant ranger amongst other volunteering experiences (for almost a year I worked / volunteered 7 days a week!) when I needed to look for another role and really struggled to even get interviews for entry level jobs with the general consensus of me not getting offered those jobs being 'good but not quite enough experience.'"*



And being able to volunteer to gain skills and experience relies upon there being the opportunities to do so:

*"Ireland lacks the volume of NGO's that can provide that experience to begin with and basic training is treated as company secrets."*

Some question the validity of degree-based training as an adequate preparation for a career in ecology, especially the higher degrees, when employers appear to value experience above all else. Do university courses offer the right curriculum

*"(The process is) demoralising. Realising that after uni you don't have the skills needed unless you have gone out and done so much extra work and voluntary experience. Kept being told I had the skills for the job but there was someone older with more experience."*

*"The expectations of the private sector are not being met by academic courses and the costs of other courses and volunteering creates a bottleneck to the kind of people that can access this sector early on."*

Getting started in any career can be tough, but the experience of many, and the observations we have made, illustrate that the ecology sector has a dysfunctional recruitment, retention and development culture which risks favouring white, middle-class, able-bodied people above all others.

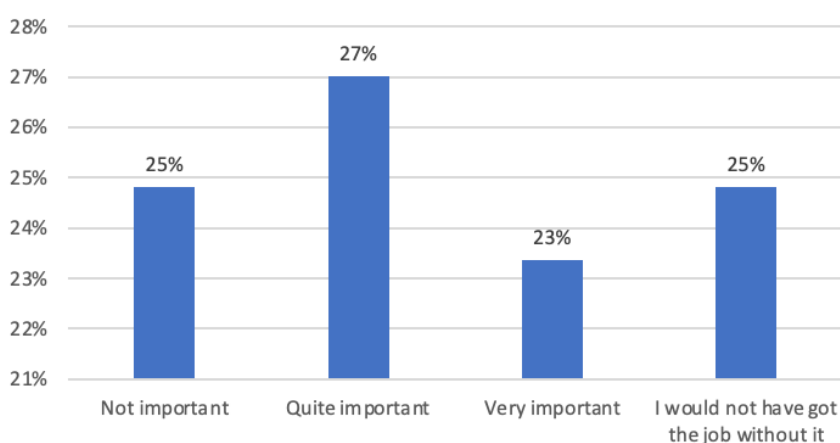
"Do only white people care about the environment? The answer is clearly no. Yet I was prompted to consider this question by new research showing that only 4.8% of environment professionals in the UK are Black, Asian or from other minority ethnic groups (compared to 12.6% across all professions)."<sup>47</sup>

This is reinforced by a lack of clarity on what degrees and vocational training should deliver, and a lack of sector-wide investment in capacity. There are too many barriers and hurdles in place to attract and retain the workforce the sector - and nature - deserves. The results are plain to see and well-recognised.

## The importance of volunteering to securing a role - analysis

Analysis from the new and recent entrant survey shows the importance of having a record of volunteering in the sector in order to secure a post - respondents were asked 'How important do you think volunteering was in securing the job you have now?' and replied as follows, with 48% stating that volunteering was very important or essential to them securing their current role. Overall, 75% of respondents felt that volunteering played a role in their successful recruitment, illustrated in Figure 10 below.

**Figure 10 The importance of volunteering in securing a role**



Clearly, volunteering to learn about most roles is an important part of the way in which people test their interests and make informed decisions. However, we have not been able to identify another profession which relies so heavily on volunteering to 'prove their worth and dedication' or to develop essential skills and experience. Whilst many in the ecology sector will say that the profession is under-valued, what does it say about how the sector views itself that it perpetuates this culture?

In summary, the 'drag anchors' on recruitment and development were evident as:

<sup>47</sup> Natasha Lohun, Communications Director at Global Action Plan quoting Students Organising for Sustainability report: <https://www.sos-uk.org/research/racial-diversity-in-environment-professions> funded by IEMA and NERC

1. Unreasonable general requirements which limit the field of potential candidates e.g., driving licence and a car for someone on the minimum wage. The net result is that the sector may unintentionally discriminate against people from poorer, non-professional backgrounds and against people of colour.
2. A culture of requiring extensive prior experience which has to be gained, almost exclusively, through volunteering or 'working for free', further limiting the field.
3. Fixed-term and / or zero-hour contracts e.g., the survey season, in 50% of advertised posts which do not work for many candidates such as those who are in a rental contract for a year, or older candidates with a mortgage.
4. A major disconnect between university training and employer requirements which makes many candidates feel as though they are 'starting again'.
5. Potentially, an over-reliance on contacts and networking to secure posts, again hindering people from non-professional backgrounds.

## Some employers are trying harder than others

This section of the report is critical of the sector, but there are employers who were willing and able to offer a better experience to people:

*"Many (even entry-level) ecology jobs seem to require previous experience on certain surveys, even though these skills could be quite easily learned on the job. Thankfully my current employer did not require previous experience and instead provided all necessary training, which enabled me to apply as I knew I would be a good fit for the job."*

*"I was often turned down (for roles) because I didn't have the practical qualifications to do the work I wanted to do. This was a problem because the courses are expensive. I was lucky that the company I was applying for was willing to take on a young and motivated person with the required knowledge, but not necessarily the practical qualifications. They are investing a lot in me, which feels good, but I know this isn't the case in a lot of roles I applied for."*

This level of investment clearly costs the employer time and money, but for many organisations this is the best way of developing the people they need:

*"We have concluded that we will have to grow our own talent, almost become an educational institution! We try to provide as much learning 'on the job' as we can, but this impacts the whole company. It's a challenge but we have to do it to meet current demand, let alone taking on more work. How are we going to reach Climate Action Plan goals without enough capacity..?" (Interview with consultancy)*

But organisations still need the 'raw material' and approaches are being developed 'out of desperation':

*"We are interviewing people who might have an aptitude for the work we do, for example being able to work outdoors in all weather conditions, perhaps have a strong interest in birds, insects or mammals, perhaps have transferable skills and experience, as well as the self-discipline to self-direct their activity." (Paraphrased from an interview with a consultancy)*

*"We like to give non-grads opportunities, address equalities issues as encountered in (a deprived part of Wales). They often have the aptitudes but not the opportunities; current approaches perpetuate this - Volunteering as a way in is a barrier to wider participation." (Interview with NGO)*

Perspectives from the interviews further illustrate the challenges of developing a fair, diverse and valued workforce, particularly in relation to vocational training. Some interviewees commented on the lack of vocational provision and limited access, the low levels of awareness in potential vocational training participants and the lack of clarity over what such qualifications will give people. There are questions over the level of demand for vocational training from both employers and those interested in ecology (borne out by the low levels of jobs advertising for vocational training).

*"There's a lack of provision and a lack of access e.g., travel 30 miles a day to do an NVQ or diploma - just doesn't work for young people. They do not know or understand what the roles are and careers services don't understand either. Degree routes are clearer." (Interview with NGO, Wales)*

*"The sector needs to focus on making itself more appealing to younger individuals and career-changers by dispelling misconceptions and changing perceptions. It should strive to modernise and incorporate a diverse range of skills and experiences to enhance capacity and achieve ambitious goals." (Interview with National Park)*

The plea for clarity and structure around vocational training was common in the interviews. Some feel the current lack of clarity reflects the fractured nature of the ecology sector, especially the NGO segment where there are a plethora of small, single-species charities competing for funding. This is echoed in how we structure our environment, with relatively small and disconnected areas of real conservation value.

*"We are a small, fractured sector which lacks cohesion and scale to deliver the ambitions of the government. Investment priorities are very skewed, organisations are fighting over scraps." (Interview with National Park)*

If this is true, then how do people with an interest in nature, but perhaps less theoretically oriented, see their place in ecology and conservation? What is the offer to them and does the sector understand the roles which vocational training could play?

Conversely, one employer related that applicants expectations for first roles were out of touch with the reality, either because there is a limit to how far a role can be tailored, or because the jobs are demanding:

*"Short-term contracts hinder recruitment, this is true, but people (applicants) are sometimes looking for the 'perfect' bespoke job (Covid has not helped in this regard). The realities of the job can be a shock to people e.g., the bureaucracy, physical nature of the work." (Interview with National Park)*

There were specific challenges mentioned by the NGOs which compound their ability to recruit, although these problems are not exclusive to NGOs. As a real example, a vocational post might be offered as an apprenticeship for a year, then at national minimum wage for a further year, raising the following problems for the applicant:

1. Housing and cost of living pressures - at this level of income, the assumption is that the person is living with someone who can pay the housing costs and bills e.g., parents or partner.
2. Transport - many such roles require that the person has their own transport and can drive to remote locations to fulfil their role. It is unclear how this is affordable unless the person is lucky enough to have someone else paying for this.
3. Attitudes - such roles have to compete with better paid options e.g., supermarkets pay at or above the national minimum wage level; the implicit message is that you take on such a role for 'love not money'.

# 3.0 Conclusions

There is a 'Perfect storm' of misaligned supply and demand with no clear strategy to drive the required changes.

## 3.1 There is a capacity and skills problem

Those people from the ecology sector engaged in the process of developing this report consistently said that there are not enough people available to fill current or anticipated vacancies, especially to fill roles which require practical ecology skills. This reinforces the prevailing narrative on capacity in the sector. The feeling is that universities are not developing the skills the sector needs and vocational training does not provide enough people to fill the capacity gap. To be effective, ecologists also need a range of tickets and certificates - these take time and rely upon having opportunities to gain them.

## 3.2 But no-one can quantify these problems

No-one can currently or satisfactorily quantify the capacity and skills problems i.e., the number of posts which are not being filled, the number of ecology and other graduates with relevant degrees who are coming into the labour market (and the number who are not), or the number of posts which the sector needs now and will need in the next five to fifteen years. Whilst there was a strong anecdotal consensus on the capacity crisis, there was no evidence of a coherent strategy which coordinates the supply (education and training) and demand sides of the sector. Not being able to quantify the problem makes it hard to explain it to others, hard to plan to address the problems and hard to gather support.

## 3.3 The sector makes it hard to join the ecology profession

Those applying for new and entry level posts are expected to meet unreasonable expectations for skills and experience. Many employers expect this to be gained through volunteering before and during a new entrants' training and education, if not as part of it. They are likely to require a driving licence and transport, protected species licenses and equipment tickets, in return for a salary a little above minimum wage and with a 50% chance of being on a temporary contract.

Those with vocational qualifications are often not catered for in job adverts, despite the apparent dearth of candidates with practical skills and experience, a key advance of vocational training.. Careers in ecology do not compete well with careers which similar science-oriented students might pursue. The culture in some parts of the ecology sector perpetuates a mindset which expects new entrants to 'suffer for the cause', taking the roles for love and not money, perhaps forgetting that the current generation of graduates leave university with £ 50,000 of debt.

The experience of many new and recent entrants, the feedback from the employers and wider analysis illustrates that the ecology sector has a dysfunctional recruitment, retention and development culture which favours white, middle-class, and able-bodied people.

**"The sector needs to focus on making itself more appealing to younger individuals and career-changers by dispelling misconceptions and changing perceptions. It should strive to modernise and incorporate a diverse range of skills and experiences to enhance capacity and achieve ambitious goals."**

## 3.4 There is lack of strategic and policy leadership by governments

Governments are conspicuous by their absence - we have seen no strategy for developing the people with the knowledge and skills needed to meet the UK policy goals, and no clear strategy from Wales, Scotland or Ireland. In England, the 2021 Environment Act said that 'the government will set statutory targets for air quality, biodiversity, water, resource efficiency and waste reduction, and a new target to reverse the decline in species abundance by the end of 2030', but made no mention of how or who will do this. It expects the Environment Act to create 'many green jobs in the nature sector' which might refer to the ecology sector, promising 'opportunity for people of all ages to train, retrain or upskill to go into green careers', which might refer to new roles in manufacturing, energy generation and water management. Where is the strategy to make this happen in the ecology sector?

## 3.5 The sector is not getting people with the skills it needs

Many sectors bemoan the lack of experience with which graduates leave university, and the ecology sector was no different during this process. However, the feedback was generally consistent and balanced, recognising the relative strengths and weaknesses of degrees and vocational training. There does appear to be a disconnect between what the sector needs in its 'new people' and the skills and experiences which graduates bring to their new posts. The ecology sector is complex and further training is essential in order to be competent, effective and employable.

However, training and development is provided mainly through mentoring and on-the-job experience, seemingly in many cases without a clearly structured development path. Underpinning this is a continued reliance on experience and skills gained through volunteering, far in excess of what other sectors expect or can provide. Note that Ireland does not have the NGO capacity to provide these experiences. Furthermore, this report highlights a potential unintended consequence of the volunteering culture - blocking qualified candidates from securing a post - or are volunteers and the newly qualified being exploited as cheap labour, as some people assert?

### **3.6 The sector is conflicted on the relative roles of degree and vocational routes into the sector, and lacks coherence on how to move forward**

The comments relating to degree and vocational course content highlighted a fundamental misunderstanding of why we have both degree and vocational routes into the ecology sector i.e., that some people are more suited to gaining skills and knowledge through an academic approach, and other are more suited to learning 'hands-on' skills, and some are suited to both approaches! We do not want to present this as a binary choice between 'vocational = practical' and 'degree = theoretical', but clearly there is a point of balance between the two and a requirement for provision to be more flexible, and for there to be more movement between the 'learning formats'.

There is a sense of the sector not thinking creatively about how it can address the capacity issue, flipping between degree and vocational approaches when, as in Ireland, there needs to be a far more flexible approach which, for example, recognises the transferrable skills which career changers or 'amateurs' might have. Most decision and policy makers, and most of those responsible for recruitment, have a degree. Is the sector prone to recruit in its own image?

### **3.7 There is a lack of consensus on 'what to do'**

In terms of 'what should be done', most of the research participants did not have clear and shared ideas. Organisations were also unclear about the role for CIEEM and Lantra, although participants in this work welcomed the renewed focus on the capacity problems they all face. What the sector does have, and can build on, is a strong shared sense of the problems it has in meeting its capacity and skills needs. We note also that very little mention was made in the process of developing this report of workload, but that this is part of the wider ecology sector employment narrative and highlighted by CIEEM<sup>48</sup>.

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48 <https://cieem.net/i-am/a-diverse-inclusive-and-healthy-profession/>



# 4.0 Recommendations

## 4.1 A sector-wide recruitment and skills plan

Quantify the problems and develop a sector-wide plan or 'workforce strategy'. The sector needs to quantify the problem so that a specific plan can be developed and shared with governments, training providers and universities. The plan should:

1. Promote awareness of careers in the sector and to raise the status of the profession. Some organisations are doing this themselves by engaging directly with schools, colleges and universities - the wider sector can learn from this.
2. Address the 'barriers to entry' more proactively so that the potential pool of people coming into the sector is maximised. See recommendation 4.3 for more detail on changes which could be made to how the sector recruits people.
3. An assessment of what is happening now on the supply side using more comprehensive data e.g., on the number of people starting, finishing and continuing with ecology-related degrees and vocational qualifications - what are the drop-out rates and what are the reasons for this?
4. An assessment of what is happening now on the demand side, through a thorough sector needs assessment, and what needs to happen in the future. Again, this should be based on better data on the number and type of ecologists the sector needs, examining requirements in relation to known and anticipated demand, broken down into key areas e.g., fieldwork (species and habitats), peatland restoration, BNG, carbon sequestration, conservation, species reintroduction and so on.
5. The number of entrants required to meet the needs of the sector, per year, is broken down between degree and vocational qualifications, including entry for graduates without relevant degrees, and people with no qualifications. There is a need for a short-term (0 to 5 year) plan to address immediate needs, whilst longer-term solutions (5 - 15 year) will develop to meet the needs identified in step two.
6. A clearer and more widely agreed curriculum content for degrees and vocational qualifications which address the sector skill needs identified in step two, developed in closer partnership between the sector and the providers - see recommendation 4.2 for more detail.
7. A clearer 'map' for further professional development of people once they enter the profession which lays out the role for continuing education and training, covering the breadth and depth of needs e.g.:
  - a. Tools and equipment
  - b. Species tickets
  - c. Site training e.g., CSCS (Construction Skills Certification Scheme), first aid, ROLO (Register of Land-based Operations)
  - d. Technology, coding and Geographical Information Systems (GIS)
  - e. Surveying techniques, and so on

The training and development offered by CIEEM, Lantra and others is a vital part of this.

8. A rationalisation of the number and type of vocational courses so that employers can more easily understand what each offers. See recommendation 4.4 for a suggested way in which this area of training could provide greater clarity.
9. Learn from others. There is scope for a further research project to learn from Europe / USA / wherever to see how they do things and how well it works.
10. Use the plan to leverage state and grant funding.

The approach should be strategic in the first instance and not get bogged down in minute details or in trying to find the perfect answer from the get go - review and redo faster, continually develop, be flexible. Getting this 80% right in the first version will be a considerable step forward. The risk is that this gets stuck in the weeds.

The output of this plan might be something which enables the sector to say with confidence:

- We understand why people are not entering or staying in the profession.
- We know how many people we need and what we need them to know and be able to do, now and in the future.

- We have a quantified and, therefore, costed plan for how we will achieve this.
- We know how we will continue to develop the skills and knowledge our people need once they are employed
- We have our training and education partners firmly behind us on this.
- We can be a growth sector offering attractive career opportunities for roles which will play a very important role in the future of our environment and economy.

'Part of this work is taken forward in more detail in some of the following recommendations. We recognise the scale of the challenge within this recommendation, not least the fragmented and mostly small-scale nature of the sector's employers but having a 'workforce strategy' or similar is the missing piece to ensure there is the capacity the sector, and nature, needs.

The work will need funding and approaching the government could be one way this is done, including through the APPGs for the environment<sup>49</sup>, for nature<sup>50</sup> (if it is still operating), for the 'Green Deal'<sup>51</sup> and for Wetlands<sup>52</sup> as starting points. CIEEM and Lantra are on the Defra Nature Skills Policy Group and this does provide an opportunity to press for support.

Examples from which the sector could learn include:

1. Health and Social Care Workforce Strategy for Wales, a ten-year strategy launched in October 2020<sup>53</sup>. This works alongside the 'Long term plan for health and social care' for Wales<sup>54</sup>, updated in 2022. England, Scotland and Northern Ireland have similar strategies.
2. The UK Government Probation Service workforce strategy<sup>55</sup>, published in 2020, updated in February 2023 and running to 2025.
3. Civil Service Workforce Plan, 2016 to 2020<sup>56</sup>.

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49 <https://environment.inparliament.uk>

50 Not sure this is still in place

51 <https://greennewdealgroup.org/appg/>

52 <https://www.wwt.org.uk/our-work/the-appg-for-wetlands/>

53 <https://heiw.nhs.wales/workforce/health-and-social-care-workforce-strategy/>

54 <https://www.gov.wales/healthier-wales-long-term-plan-health-and-social-care>

55 <https://www.gov.uk/government/publications/probation-workforce-strategy>

56 <https://www.gov.uk/government/publications/civil-service-workforce-plan-2016-to-2020>

## 4.2 Strengthen partnerships with existing courses delivered by colleges and universities; and with their students

We recommend strengthening partnerships with existing courses delivered by colleges and universities to support them in their efforts to align more with skills ecologists need now and in the future. All of the options we set out later in this section have promise, however they also come with disadvantages, and there are compelling reasons to try and improve what we already have and get it working better for employers, providers and students. Partnerships between professional bodies and providers can be formal, for example the way CIEEM accredits specific programmes that demonstrate alignment to a Competency Framework. Interactions can also be more informal. This could be more appropriate for degrees that have some ecology content, but would be unlikely to seek full CIEEM accreditation including environmental science, environmental management, geography and biology.

CIEEM is currently accrediting only a relatively small proportion of the courses attended by new ecology graduates each year. This is even smaller when related degrees are included. This limits the ability of CIEEM to influence the skills ecologists gain on their degrees, in comparison with other disciplines that ecologists work with (Planners, Landscape Architects). In these professions, accreditation by a professional body plays a more prominent role in recruitment, and lacking it can represent a barrier to entry, in both the public and private sectors. Partnerships between a professional body and university can be reduced to transactional arrangements. The professional body benefits from fees the university pays. The university benefits from a 'badge' it can use to attract potential students. The university may struggle with specific requests from a professional body for skills to be included in the curriculum. For example, the survey and workshops showed very mixed experiences from new graduates with GIS, a key skill for ecologists. It is challenging for universities to retain staff who have a good knowledge of the software, communication skills to teach it, and can apply GIS to real world ecology problems. Universities are competing in the labour market for those individuals, who are sought after in the private sector and by regulators employers. Universities will therefore push back against well intentioned suggestions from professional bodies for such changes to their courses; and as demonstrated by recent strikes and marking boycotts within Higher Education, may lack the time required to update course materials

CIEEM could look again at this partnership offer and see if more providers could be encouraged to become accredited. This would increase its ability to shape the learning of those entering the profession. It would have the additional benefit of more people early in their career having contact with CIEEM. Could the CIEEM membership process be simplified so that graduates automatically gain professional membership rather than having to complete additional paperwork or assessment, as currently happens in Forestry, Management, and with IEMA Chartered Environmentalist. Universities struggle to have meaningful employer engagement during the formal review of their degree courses, and these can be reduced to tick box exercises. Another thing CIEEM brings to a partnership with universities is strong employer engagement. This is highly valuable to any degree programme review process. Other professional bodies such as the RTPi (Royal Town Planning Institute) also offer (and require) careers talks to graduates on the different pathways in the sector. Other careers opportunities come from taking part in the Young Planners Network. These are not delivered by national RTPi employees, but are led by members based in the regions. These would be very valuable to universities as part of their efforts to improve employability. Some presence from CIEEM on campus could also be very valuable in encouraging people on existing qualifications towards careers in ecology. As an FE lecturer, who used to work in ecological consultancy notes:

*"CIEEM could run an event to host an introduction to ecology talk at which our students could go to and all the other students on these courses could go. The students need to feel as though this industry is real. I tell them, of course, but it hasn't got the same impact as if a professional body runs an event saying our sector needs people, and we need them to have these skills. And that that would be a really good that really would inspire them. I'm confident about that, especially where their modules align with what the sector needs then that would be fantastic."*

The material in the CIEEM Resource Hub and In Practice could also be made available to teaching staff at partner providers (regardless of their personal CIEEM membership status). These would be useful for lecturers in keeping their learning materials current. Now CIEEM accredits only undergraduate and postgraduate programmes. CIEEM should look at the options for accrediting existing vocational qualifications. As a lecturer at an FE college notes:

*"So CIEEM endorsed lots of university degrees. So you can get ecology degrees that are endorsed by CIEEM. If you could have something like that for a vocational - which was criticised and reviewed by CIEEM. It could be that they endorse a module, they don't need to endorse the whole BTEC"*

There is also scope to improve routeways for those who have completed vocational courses into CIEEM professional membership. As the same lecturer notes:

*"I've encouraged a lot of the students who are interested in ecology to become student members sign but I think you have to technically be on a degree course and I don't think they let you do it on a vocational one for the student membership, right, I will look into so if you can't do it, then that's the first barrier."*

In particular for the courses that CIEEM has been involved with the development of: the Level 6 Environmental Practitioner apprenticeship; the Level 7 Ecologist apprenticeship and the Level 4 Countryside Ranger.

The point when a course gets revalidated is a key opportunity to bring about change. However, not all of the changes require revalidation or even changes to individual module descriptions. An assignment briefing that says students write a 2000 word report could be adjusted to be in the style of a consultant's report or habitat management plan. Students could be steered towards materials that relate to a live planning topic on which to base their report, or even work with employers willing to provide live assessment briefs. Good examples of these more authentic approaches to learning could be shared through In Practice and CIEEM blogs.

Looking above the level of individual courses, CIEEM also has opportunities to shift what is taught on degree programmes through participating in reviews of subject benchmarks. University academic quality teams will draw the attention of teaching colleagues to these documents, and ask them to demonstrate systematically how it aligns in the core modules. These are things that CIEEM could seek member assistance with, in the same way as the CIEEM policy team is supported when responding to large Government consultations.

University degrees are subject to thorough review every five (sometimes six) years. Individual modules are reviewed annually. The content of vocational qualifications are not subject to regular review. The opportunities for change to existing vocational qualifications do not exist, and CIEEM will need to look for other ways to engage.

The current approach to skills that CIEEM (and other independent training providers) are taking by default involves people early in their career paying with their own money to be upskilled in topics including QGIS for ecologists, Environmental Law and Policy; and survey skills such as UKHab. These are things that ecologists should already be learning on their degrees. A key reason they not being taught, or being taught using out of date knowledge is a lack professional development and training available to college and university teachers. In universities, there can be funding for professional development that supports research funding, but teaching does not have this priority. In most colleges our stakeholders thought there was very little time, budget or culture to support subject related professional development. If a tutor is not up to date on UKHab or recent law and policy they struggle to pass that on to their students. If CIEEM and others want to see more students leaving courses with those skills, then it could find ways to offer CPD at no cost to college and university teachers. This could be offered as part of a partnership package, or parts of the sector that are well funded and need these skills approached to sponsor it.

There is significant scope for CIEEM to build upon and improve its relationship with providers. During the course of the research a generous offer was made by Universities UK.

*"If there was something that UK could help with, we'd be interested in exploring that because we will be collaborating with the aviation sector and bring it together with aviation sector employers, with universities, and helping with that we're linked with the financial services sector."*

Stronger dialogue could help build partnerships that benefit universities and their students while assisting CIEEM in addressing the skills gap in the profession.

### 4.3 Reform recruitment processes

In the context of a sector which cannot recruit enough people, and people with the right skills and experience, decisive steps are needed in order to break the cycle of the sector 'competing with itself'. Organisations in the public and private sector benefit from skills developed in another organisation rather than doing more to bring in and develop new people. We believe changes are needed to recruitment practices in ecology, and without these, efforts to add more people through vocational qualifications will be adding to a 'leaking bucket'.

1. It is not enough to say 'or equivalent' on job advertisements when trying to recruit people with vocational qualifications! Adverts should say in positive terms what the employer will accept e.g., 'We welcome applications from people with Level 6 apprenticeship as Environmental Practitioner, degrees in ecology and environmental management, NVQs in... etc.'
2. Rethinking requirements for 'x years of experience' for new entrants, not least because this says nothing about the quality of that experience.
3. As part of the 'offer' to candidates, make a clearer and stronger commitment to in-job training and development. CIEEM has a wealth of existing resources and policy around CPD which the sector could make much greater use of.
4. Say how they will support the candidate to gain required qualifications e.g., 'The post requires training with the safe operation of brushcutters and chainsaws and this will be provided to the successful candidate, as will training to achieve a bat licence.'
5. Make ecology roles more appealing to candidates by including clear career progression pathways. This was something four of our workshop participants said they would be taking back to their organisation. As well as starting pay, there is also the issue of pay progression.
6. Reduce the use of temporary and short-term contracts and provide greater job security. Temporary summer demands should instead be addressed through paid internships, widely used in other professions.
7. Challenge very firmly the corrosive and discriminatory culture around volunteering as the main means by which people are expected to gain skills and experience, especially as a means of achieving tickets and certificates.
8. Address the cost-of-living crisis impacts by providing ways of supporting new entrants with the costs of securing a driving licence and a car/ pool car where travel by car is needed for their work.
9. Provide support for housing costs where workplaces are remote and expensive.
10. More positive consideration to help achieve a work-life balance, and reducing the requirements to work unsocial hours to those that are ecologically essential e.g. bat surveys.

We firmly believe that employers who can address these points will compete more effectively for good candidates, keeping more people in the sector.

CIEEM cannot compel organisations to recruit in particular ways. But it does have a number of options for leverage.

CIEEM is a key site where job adverts are shared. It could set out, with example wording, how to advertise posts in a more inclusive way which encourages applications from a wider range of candidates, including vocationally trained, career changers and people with transferable skills. It is already refusing to publish 'volunteering' posts that are really jobs, but more could be done with this leverage.

Telling employers that they are wrong not to be advertising their jobs to people from vocational pathways is unlikely to be an effective way to change behaviour. We found after the 'dream team' game participants had a positive view of people from vocational pathways (far more than the stakeholder interviews), indicating its potential to change behaviour. Our sector workshops were joined by some participants who were relatively new to building and managing an ecology team. They valued the opportunity the workshops gave to discuss their recruitment concerns, and lacked other ways to have these conversations and develop themselves as managers. We recommend looking for other opportunities to use the dream team game with the sector, including any public launch of this work.

CIEEM could develop a concordat and steer the sector in reaching a united approach to ending exploitative labour practices. This will not end these exploitative practices overnight, but does provide a mechanism for the ecology sector to have a much needed conversation about how it trains and employs people. It also provides some leverage for those early in their career when their employer falls short of their public commitments.



Develop a national pay framework: In other sectors that struggle with low pay, recruiting people with current technical skills and a volunteer culture, larger organisations have taken the lead. The National Archives has produced a national pay scale which outlines the roles and responsibilities at different levels. In common with ecologists, archivists work in the public, private and voluntary sectors. The National Archives has no power to compel employers, but those employers that publish adverts that diverge from the scale are 'called out' on job forums and external funders are placing increasing weight on it.

For employers that fail to meet legal requirements, such as paying the minimum wage CIEEM should consider if they should be included in the list of accredited consultancies. Breaking employment law should be regarded as serious, in the same way that a consultancy could be removed if it breached environmental laws.

#### 4.4 Create a new Level 4 vocational qualification for 'ecologist technician' funded through the apprenticeship levy

We recommend the sector scope out a new Level 4 qualification of 'ecologist technician'. Using funding from the apprenticeship levy, skills would be developed over two years in the workplace and in a structured educational setting. There is a reluctance on the part of Government in England to have new vocational qualifications unless strong employer support can be demonstrated. However, this is an area where there is much more willingness on the part of IfATE to allow new qualifications, aligning with its organisational priority to support green skills. The process of defining an ecologist technician would be employer led. It is for the ecology sector to create and define a new occupational standard. In future, this occupational standard could have other roles in addition to apprenticeships, allowing taught qualifications not attached to an apprenticeship to be developed at Level 4 - aligning to the occupational standard.

The idea for an ecologist technician emerged independently from several separate discussions during our research. In the workshops, our discussion about the complementary skills of people with vocational qualifications and degrees led to the view that they could work alongside each other in a team. To give an example of how this could work in practice, most organisations have policies now about lone field working. For ecological survey work, both the graduate ecologist and the ecologist technician conduct the survey work together. The ecologist technician brings good knowledge of survey techniques and species ID skills. They lead on data for the report, but the main report writing is by the graduate ecologist. This means that someone whose main strength is not sitting in an office all day and writing a report, is not pushed down that route. The work of report writing is also likely to change in the next five years with the rise of AI. In the near future, what the graduate will mainly bring are their analytical skills - using ecological data to make robust recommendations. The ecologist technician brings practical knowledge of how things work on the ground that cannot be replaced by technology. The ecologist technician could perhaps contribute more to the 'writing' with the assistance of AI software.

It has some common features with the registered environmental technician accreditation which SocEnv which describes as:

*"Technicians are the doers – they're in the workshop, out in the field, researching, problem solving and checking off project tasks....REnvTech highlights that they will do this professionally and with competence. They keep the cogs turning on our journey to a more sustainable world."*

There are also many common features with the new Level 4 forestry qualification. The idea for a new Level 4 ecologist technician was tested in the interviews with those experienced in vocational qualifications. In these interviews, the advantages of the proposed qualification and potential barriers and challenges were raised.

One important early question for the sector is how broad or narrow this new ecologist technician qualification is. They cannot cover all the topics in a degree through a two-year work-based learning model. Equally, if it is skills that someone could be trained in over a few weeks, short courses and bootcamps are a better route. Is the ecologist technician going to be something that meets the needs of one part of the sector, private sector consultants or NGOs or local government, or is it meeting a cross-sector skills need? If it is defined too broadly then participants will gain superficial knowledge in too many areas and will not be able to apply it in a workplace. If it is too narrow, then there is a problem for participants having enough roles to apply for and later in moving jobs. Too narrow framing would also be unappealing for providers because they would feel it would struggle to recruit. An experienced FE ecology tutor, when discussing the idea, thought the habitat management skills work well alongside ecological survey skills.

*"So, when I worked in consultancy, we would go in and they just focus on consultancy, and then they hire in set someone separate to do the practical stuff, like building a badger set or whatever. But our students quite often have these practical skills higher than a lot of graduates. Yes so if you have that aggregate of both students who could go out to be college ecological technicians, do the field work, and hand it back to the people in the office who will write into report and recommendations, then they can go out and do the practical work as well. And they'd be very good at it...I like the phrase ecological technician, if there was a pathway called that specifically, it would be immensely popular."*

The sector needs to put time in together to address the scope and to get it right. If this is superficial or rushed, then another ecology qualification is likely to be put forward two or three years later to address the ongoing skills gap, adding to the existing confusion about the names and titles of qualifications. As an interviewee with experience of vocational pathways noted:

*"We need the employers to have a really good think about, what is it that's non-degree level that people could do?"*

It is extremely difficult to change qualifications once they are set, even for glaring factual errors and omissions. This negative feature of apprenticeships was already being commented on by two participants in our workshops who had apprentices.

We recommend that significant additional resources are factored in to assist in managing meaningful engagement with the ecology sector. Chairing the trailblazer is a substantial piece of work - facilitating and co-ordinating sector inputs into the new qualification. This is something some 'trailblazer' groups have done very well, but others have done poorly. Many of the successful examples have paid for a facilitator to assist including health, engineering and construction. We also suggest financial remuneration for the time involved for small and medium sized NGOs and AONBs and smaller consultancies. This will reduce the chance of the resulting qualification only addressing the needs of large organisations with dedicated capacity for external engagement. The other important reason for a wide range of employers to be fully involved is that it will create recognition, acceptance and a sense of ownership towards the qualifications that result. The work of the trailblazer lead is substantial and CIEEM may wish to try and leverage in funding from the sector to support it undertaking this work.

Once the trailblazer group is established, it needs to collect robust evidence to define the occupation that the new qualification leads to. This evidence comes from two main sources: reviewing job advertisements and person specifications to get a set of common requirements. The analysis of job advertisements in this project is an important first step in that work. The next stage is for the group is to define the knowledge, skills, and behaviours (KSBs) that the role needs. The next stage is a recommended funding band, which has to be approved by Government. In other related sectors this had been a cause of lengthy dialogue, where initial funding band allocations were too low to support the delivery of a quality learning experience. The rigid funding bands are a key disadvantage of this overall approach. Perhaps contrary to popular belief, it is significantly more expensive for providers to deliver an apprenticeship model than by more traditional methods. This is because of the extra investment required to support employer engagement, tutorial support and monitoring for apprentices, administrative support to ensure compliance, and costs that may need to be paid to an End Point Assessment Organisation. It is also not possible for a university to cross-subsidise the fees through recruiting international students, who cannot undertake apprenticeships. In terms of delivery the most obvious options are FE colleges that already deliver land and countryside programmes; or universities that have processes in place for working with employers and managing Ofsted inspections. A third option, which has been used in other sectors is for a large public or private employer to deliver it in-house, without using a university or FE college.

In developing the occupational standard for a level four ecologist technician, the trailblazer could also consider what are the qualifications that are feeding into it and what is the career progression for someone who has completed it.

*"So the example might be how do you move from being a countryside worker? countryside ranger to an ecologist? That seems like a logical step with the right sort of training in between.... How do they see people transferring where do they want to have a pathway and what do we need to do to support them to facilitate it? And what pathways do they think would never work? Even if it looks like on paper, it's close?"*

One IfATE staff member is working with diverse sectors ranging from health and science care services, hair and beauty, catering, and hospitality, and education. They do not come with, or have time to develop sector knowledge; or have the capacity to support sectors that are not able to manage their own stakeholder engagement processes. IfATE found their previous experiences working with the ecology sector and CIEEM challenging. In work on the Level 7 qualification for ecologists IfATE noted:

*"Our challenges are probably because there's quite disparate people working in the area, and they don't always agree on what's needed. And they don't always agree on how best to go forward."*

## 4.5 University certificates, corporate accreditation and micro-credentials

We recommend that CIEEM supports and facilitates the development of accredited university certificates in ecology. We initially suggest these at Level 5, although further consultation with the sector may identify that Level 6 or 7 is a better fit.

These would not receive apprenticeship funding, so would need to be self-financing with employers and/or participants paying fees. If the Lifelong Learning funding were to be developed further, this could be a potential source of funding, but the current format which focuses on loans is unappealing. This lack of funds is a potential disadvantage, however, unlike apprenticeships and bootcamps, they would not be impacted by policy changes to vocational funding, having to stand on their own merit without external subsidies. It is also possible that a broader definition of the things that the Apprenticeship Levy funding is used for could allow employers to use it for programme like this. Many employers across a range of sectors are calling for such reform of how the levy operates and for a proportion to be spent on other kinds of skills development.

Unlike apprenticeships, they would be covered by standard university quality assurance processes and not involve additional regulation from Ofsted. This removes the barrier for universities who do not wish to be drawn into inspections for a single programme. It also means they could be set up much more quickly, using only the universities' own processes for establishing a new course, and not be dependent on the lengthy Trailblazer process discussed above. There still needs to be employer engagement, and desk research to demonstrate there is a market for the course. The exact format for this will vary by university, but the information in this research provides a strong starting point for the skills that ecologists need from the perspective of employers and new entrants. The certificate would also be subject to university quality assurance and review processes. Although this is a cause of regular complaint among those teaching in universities, it is far more flexible to review and update content to reflect emerging issues in the sector than apprenticeships and other vocational qualifications. Participants would leave with a recognised qualification, in contrast to bootcamps and non-accredited in-house graduate training from employers.

More thought is needed into who the target audience is but could include:

- People who have completed a vocational qualification in a related subject such as agriculture, horticulture, forestry, countryside ranger to move into ecology.
- People who have a vocational qualification and work experience in another subject who want to move into professional and project management roles in ecology.
- People who have a degree in another subject and a strong personal interest in ecology.
- Recent graduates who are looking to fill key gaps left in their degrees, including degrees in biology, geography, environmental science and environmental management which had some ecology but not in sufficient depth to undertake many ecology jobs.

Potentially these groups could be taught together. There is the opportunity for them to learn from each other in a positive way. A university setting can provide a 'grown up' feel to the learning environment in contrast to sixth-form colleges and some FE settings. The certificate should be taught in a stand-alone manner and no attempt made to combine delivery with existing undergraduate modules. Care needs to be taken to avoid prior assumptions e.g. not assuming knowledge of genetics that comes from A Level biology or landforms from A Level Geography. The learning style is also important and avoiding for example, delivery that relies heavily on PowerPoints and lengthy formal lecturing.

One way to identify a university partner could be by looking at universities that are already taking this approach with skills gaps in other disciplines and offering certificates. This suggests they have the interest and flexibility to develop new courses that are not under- and postgraduate degrees. That they are willing to invest time in promoting the course and some engagement with local and regional employers. This is much more light-touch than apprenticeships, but is needed to make sure the programme is meeting a regional skills need; for real case studies and examples to use in the learning materials; and for some employers to support their staff attending with time from work and fees. One way CIEEM could improve the financial viability of these is passporting those who have completed them into an appropriate grade of CIEEM membership and joining fee waivers.

There is also a variation where an employer works much more closely and becomes an associate tutor on the certificate – illustrated in the example from Chester below. The role taken by Barefoot below could be taken by an existing ecology training provider or CIEEM. The other option is for a large employer to take the role taken by Barefoot and advertise jobs with a focused, accredited qualification embedded in it. In this model, there is considerable flexibility about fees. The university charges the employer a fee for validation, so they are not pegged against standardised university tuition fees. Employers responses have been very enthusiastic of this model. The challenge is more for universities, which can find it 'messy' compared to the more common ways they recruit and teach students. This will not work for all universities, and many would rather focus their recruitment and marketing efforts on more lucrative international markets. Most universities have signed climate emergency declarations, and many have core values that reference a civic mission. A new certificate programme in ecology to meet a regional need aligns closely with both the climate and civic agendas, and could be used to secure high-level support of university leaders.

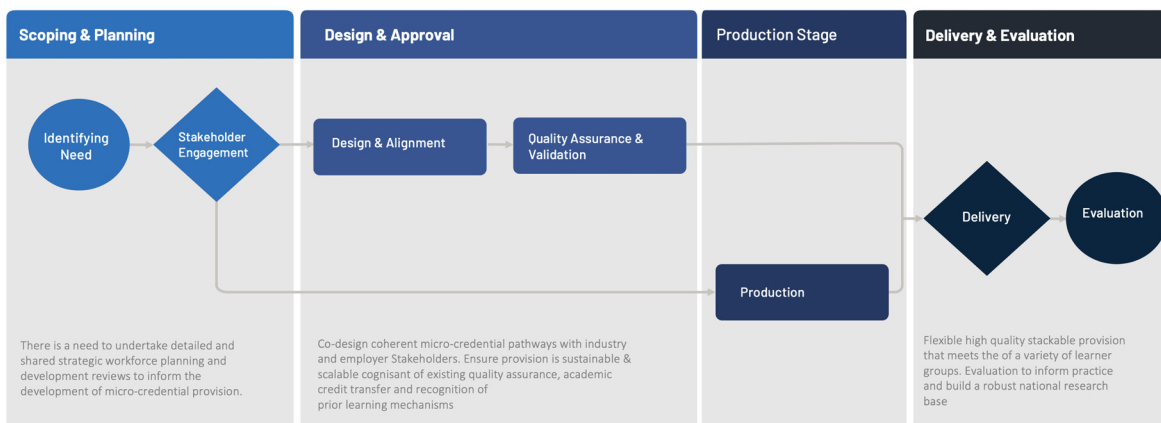
## Example: Chester University

The University run a corporate accreditation service. The Centre’s approach has been commended by the UK Quality Assurance Agency and showcased by the Higher Education Funding Council for England. It works with a range of regional and national training organisations to accredit training provision across the UK. Examples of sectors they have recently worked with include linguistics, social work, health and social care, communications, and coaching. Barefoot coaching collaborate with Chester University in a certificate programme. Barefoot were an established training provider, well regarded in the sector for their coaching training. Despite some differences in organisational style and culture the partnership had flourished. Barefoot deliver the coaching programme and Chester University academics trained the trainers in Barefoot to deliver the academic bits of coaching alongside the practical bits of coaching. The University assigns a link tutor who to maintain that relationship and has responsibility for making sure that the staff who delivery the training have sufficient expertise to do so and participants undertake a programme that is to a good academic and professional standard. So far they have large numbers of people come through their books. They become qualified coaches, combining practical and academic knowledge.

## Example: Cardiff Metropolitan University Micro-Credentials

Many universities have tried to bring in short courses and certificate programmes, to be confounded by internal university structures. The pilot at Cardiff Met, funded by the Welsh Government has worked to overcome those barriers and produced a resource ‘The Micro-credential planning framework’ for universities and FE colleges. It helps them work out how to run micro-credentials with existing administrative systems. The approach also avoids any un-intended consequences with their regulator such as reporting completion data. The pilot worked on sport and healthcare, with the sport micro-credentials progressing most quickly. Cardiff Met has now validated of a Certificate of Higher Education Sport Management with six Level four 20 credit stackable micro-credentials by Cardiff Metropolitan University. The professional body CIMSPA was very involved in the design of the programme, Each stackable micro-credential is aligned to deliver key aspects of the national CIMSPA Entry Manager Professional Standard. Participants can take these as stand-alone professional development courses or they can also accumulate them to be awarded a university certificate. They can take them in any order, with two start dates each year. There is significant opportunity for delivery of the programme at scale. This model does come with some disadvantages. The fees are set within university fee standard structures and there is no room for them to be re-aligned for particular sectors. There is also limited scope to include ‘tickets’ within the course fees.

Figure 11 Micro-credentials planning toolkit introduction



## 4.6 Skills Bootcamp

We recommend the development of Skills Bootcamps as a promising approach for addressing the skills needs of the ecology sector. They appear especially applicable for supporting people who have a personal interest or hobby in ecology who wish to turn that into a job. These could be young people who have a passion for natural history (e.g. birds, invertebrates). An even larger group of potential participants are mid-career changers, who wish to turn their personal interest into their work. Bootcamps have considerable flexibility compared to other models. Running at a regional level could also allow for adjustments, to focus on the variations in ecological skills that are needed.

In contrast to apprenticeships, the model appears to work consistently well for smaller and medium sized employers - in previous programmes three quarters of participating employers were SMEs. In the example below the employers collaborated closely in all stages of the bootcamp, inputting into course design, participant selection process, hosting learning activities, and interviewing those who have completed for jobs. Another variation of the bootcamp model is to deliver them to those already in employment. In these instances, it must still be free to participants, but employers pay part of the costs (30% for larger organisations, 10% for SMES).

Experience from other bootcamps in technology, construction and low carbon retrofits provide important considerations for a bootcamp to address skills in the ecology sector; in particular allocating sufficient time and budget to develop high quality learning resources. Skills bootcamps, are not restricted to any pre-set funding bands for delivery costs. Tickets are often built into the costs of the programme, for no additional cost to participants. This is common in other bootcamps such as construction, so would be viewed positively when proposals to run Bootcamps are evaluated. There is also significant flexibility to purchase equipment needed to support learning, something that can be a challenge on taught programmes in FE colleges. Value for money still matters, but there is considerable flexibility in putting the case for funds to deliver a high-quality course that leads learners into work. The content can also be readily updated to include new and emerging skills needs, in marked contrast to most other vocational pathways. Bootcamps have also shown they can attract participants from diverse backgrounds including minority ethnic groups, those with disabilities, and those with caring responsibilities.

### Example – New Futures

This training academy was established by Belfast City Council (BCC), with support from Learning and Work Institute through their New Futures programme, funded by the Covid-19 Support Fund. In their development of the Tech Academy, BCC worked to challenge perceptions that high level qualifications are required to work in the technology sector. Recruitment for the Tech Academy focused on people who have not had previous experience of the tech industry, but had a personal interest and desire to change career into tech. The training curriculum was designed around employers' needs, through a co-design process. People completing the academies were very well placed to fill specific gaps employers had vacancies for. Employers also participated in the selection of applicants onto the programme. The programme is full time over 14-16 weeks, so cannot be combined with full-time work. It is free for participants to attend with additional support for travel expenses and childcare costs if needed. All participants are guaranteed a job interview at the end of the Academy, with some learning taking place in site visits to the companies who are involved in the programme. Although the costs per person are relatively high compared to other forms of short-course and training provisions, the experience of the Tech Academy demonstrates that it is possible to support people with an interest but no qualification in a technical area to gain sufficient skills to fill current graduate vacancies. In addition, collaboration with employers with a focus on the skills they need has enabled the Tech Academy to avoid the pitfalls of some vocational training courses, where applicants complete the qualification and then have to try and find a job. In this instance, there has been no apparent negative impact of a lack of endorsement of the programme by any college, university or any professional body.





## Tech Lancaster

One example of a group SME of employers who are working together is Tech Lancaster. All the SMEs work in 'the electronics area'. And they collaborate to train people for their vacancies because as SMEs, they only have a few each. The bootcamps have expanded and now offer participants the choice to specialise between two pathways. Closeness to industry and a flexible curriculum means they are aware and able to update the bootcamps each year with new and rapidly growing fields including cyber hardware and IoT (internet of things).

## Next steps for bootcamps

Ecology clearly falls within the green skills remit of the programme and green skills, so there is no need to argue a special case for inclusion. The next window to release funds has not yet been set, it should be in 2024 but may be impacted by the upcoming election cycle. Only organisations who are on the Dynamic Purchasing System can apply for funding. The portal is open for new organisations to be added at any time, and CIEEM could put itself forward, and encourage other organisations involved in the training of ecologists to do the same. Small and micro training organisations, who run bootcamps would need to be mindful of cashflow. The payments come in three phases 40.30.30. Not something that is a barrier for a university or college but could be a challenge to a smaller training organisation. When the next funding window opens, there will then be a range of organisations who are able to take up the opportunities. Finding the right organisations to deliver the bootcamps is essential. While the overall outcomes of bootcamps have been very positive, a small number have underperformed, with a tickbox approach to employer engagement and pathways into employment.

While awaiting the next funding window to open, there are opportunities to build collaborations and to think more about what bootcamps could be put forward. There are many examples from existing bootcamps of consortiums of providers working together. There may also be more immediate options bring forward bootcamps with those already on the Dynamic Purchasing System and funded in the current round. Those who are already approved and who secure funding in this round can apply for a variation and to run new bootcamps in addition to those they bid for. The new bootcamps would need to delivered for the same budget per bootcamp as those that are already approved, which is a notable constraint. Another more promising way to take things forward is through the regional allocation of funds. These are devolved to the 30 areas that correspond to Local Enterprise Partnership (LEP)/ Local Skills Improvement Plan (LSIP) areas. The calls for new bootcamps are not co-ordinated, so one way forward would be to identify promising regions where there is a specific skills gap and interest from employers and a delivery partner and then approach them directly.

Bootcamps are not the solution to every skills issue in the ecology sector, and it is important to think carefully if the skills needed can be delivered in this format, full-time for a maximum of 16 weeks. If that is not possible, then other formats, such as apprenticeships need to be considered. If the sector also decided in parallel to take forward a new occupational standard, then there would be an expectation that any bootcamp would have regard to that. But an IfATE standard is not required to bring forward a bootcamp proposal and it is not obligatory that the IfATE standard defines the bootcamp content. As with all the other options, there are risks that formats and funding streams could change after an election in 2024. However, the time commitments for CIEEM and the sector to engage are comparatively modest compared to apprenticeships.



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CIEEM  
Grosvenor Court  
Ampfield Hill, Ampfield  
Romsey, SO51 9BD

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