# ECOLOGY SKILLS & CAPACITY IN IRELAND

FIONA NULTY, KILIAN MURPHY,
BEN IVEAGH & ADAM KANE

CIEEM

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## Key Authors and Researchers

Fiona Nulty BioSense

Kilian Murphy BioSense

Ben Iveagh UCD

Adam Kane UCD



## Reviewers

Elizabeth O'Reilly CIEEM

Brian Heppenstall CIEEM

Andrew Speer Scott Cawley

Rory Canavan APEM Group

Pat Roberts MKO

# Executive Summary

Commissioned by CIEEM, this research engaged three cohorts across the sector: professionals; academics; and students; to examine the main skills and capacity challenges affecting the ecology profession in Ireland, their drivers, and the actions required to address them.

The report shows that the ecology sector in Ireland is experiencing a significant capacity challenge. The issue extends beyond recruitment difficulties within individual organisations and has wider implications for project delivery, environmental compliance, and national policy implementation. Ecological skills are an essential component of statutory assessment, planning, infrastructure, housing, renewable energy, biodiversity reporting, and nature restoration. Evidence from this study indicates that skills shortages, limited training opportunities, and barriers to career entry and progression, are already affecting the ability to meet demand, while legislative and policy requirements continue to expand.

**Professional Participant:**

"I'm turning away work on a weekly basis."

(Private Sector Consultant)

Participants commented on a range of issues contributing to the capacity crisis:

| Survey Insights | Finding |
|---|---|
| Participants aware of and affected by skills gaps | 82% |
| Professional respondents whose organisations cannot meet project demand due to staff and skills shortages | 45% |
| Participants who consider communication between academia and industry is adequate | 21% |
| Participants who consider undergraduate courses teach the requirements for entry-level roles | 30% |
| Participants who anticipate skills needs will change in the foreseeable future | 65% |
| Professional respondents who said training courses would help to address the skills gap | 96% |
| Professional respondents who think structured internships or apprenticeships are necessary for graduates to meet entry-level requirements | 76% |
| Professional respondents who use field skills less as their career progresses | 67% |

The findings show that sector capacity challenges are driven by four main issues:

| Key Driver | Summary |
|---|---|
| Skills and training | Shortages of personnel with the required applied skills, particularly in field surveying, policy and legislation, environmental assessment, project management, and report writing. |
| Career entry pathways | Entry routes are narrow, with limited awareness of ecology careers. Graduates report difficulties in accessing genuine entry-level roles, and alternative pathways for career changers remain limited. |
| Career progression | Progression often depends on moving away from technical ecology and into management-focused roles, which can impact employee retention and create bottlenecks at senior level. |
| Working conditions | Workload, seasonal pressures, pay, the late integration of ecology in projects, and limited ecological expertise in related sectors such as planning contribute to sector strain. |

**Professional Participant:**

"There is an unprecedented skills shortage within the ecological sector due to increased workload and individuals graduating from degrees which lack training within relevant areas e.g. environmental legislation, specialist field skills, relevant reporting."

## Context and Implications

The capacity issue must be understood in the context of current and forthcoming statutory requirements, policy commitments, and national development targets. Ecological input is required across a broad range of legislation and frameworks, including the Birds and Habitats Directives, the Climate Action Plan, the National Biodiversity Action Plan, the National Development Plan, the Planning and Development Act, and the Nature Restoration Regulation. These create ongoing requirements for expertise in ecological survey, assessment, reporting, mitigation, restoration, monitoring, and compliance. In addition, national targets such as the delivery of 300,000 new homes by 2030; 80% of energy from renewable sources by 2030; a €275.4 billion infrastructure investment from 2026–2035; and the need to meet significant area-based targets under the Nature Restoration Regulation will increase demand for ecological input substantially and will require significantly greater sector capacity. The findings indicate that the capacity crisis is not only an issue for the ecology sector. It has implications for the timely delivery of high-quality development and infrastructure, for compliance with environmental obligations, and for the availability of ecological expertise needed to support restoration and long-term biodiversity management.

## Building Capacity

The ecology sector in Ireland has expanded significantly in recent years, as biodiversity, restoration, and environmental compliance have become more prominent within policy, planning, and project delivery. This is a welcome development; however, the increased expectations placed on the sector have not yet been matched by the investment and support needed to grow the profession at the scale now required.

The greatest shortages are in applied technical competencies, particularly in field surveying, impact assessment, reporting, policy compliance, and project management. These are the functions needed to inform projects, support decision-making, and implement ecological requirements in practice. Where capacity is limited in these areas, the effects are felt not only by employers trying to recruit and retain staff, but across the planning, regulatory, and project processes that rely on ecological input to deliver projects lawfully and effectively.

For that reason, capacity building cannot be addressed through a single intervention. It will require coordinated action and investment across higher education, professional training, support for employers, and public sector resourcing. Investment in university provision is part of this, but so too are stronger links between academic learning and applied practice, more accessible upskilling opportunities, alternative entry pathways to the profession, clearer career progression pathways, and better support for early- and mid-career ecologists.

**Professional Participant:**

"There needs to be greater scope for apprenticeships in certain field skills, greater mentoring programmes, internships throughout college, and placement. Practical skills, common sense and the ability to work professionally within an organisation only comes with time in the field or workplace."

**Academic Participant:**

"We need to repeatedly persuade the university management that this is a real skills gap, that there's a genuine, definite jobs market out there for graduates."

## Recommendations

The recommendations set out in the report fall under three broad headings:

| Priority | Focus |
|---|---|
| Entry and access | Improve awareness of ecology careers; strengthen placement opportunities, internships, apprenticeships, and alternative career entry pathways |
| Skills and workforce development | Improve alignment between education and workforce needs; expand applied training, CPD, micro-credentials, and develop senior technical and management career progression pathways |
| Systems and project processes | Build ecological expertise within public systems and adjacent sectors; improve coordination, standardisation, data-sharing, and earlier integration of ecology in projects |

## Conclusion

This report shows that the ecology sector in Ireland is operating under sustained capacity pressure at a time of increasing demand. The issue has implications not only for the sector itself, but for the delivery of wider national objectives in planning, infrastructure, housing, and nature restoration. With the right capacity-building measures in place, the sector will be better equipped not only to support sustainable development, but also to deliver on nature restoration objectives. Strengthening capacity within the ecology sector should therefore be understood not only as a workforce issue, but as an investment in the people, skills, and systems needed to protect, restore, and support the long-term stewardship of the natural environment.

# Introduction

The professional ecology sector in Ireland is experiencing persistent recruitment and capacity pressures at a time when demand for ecological expertise is increasing across planning, infrastructure delivery, nature restoration, and biodiversity enhancement. This creates significant challenges for organisations across the public, private, and NGO sectors in scheduling and delivering the high-quality environmental assessments and inputs required by law to support development projects at the necessary pace.

This research was commissioned by the Chartered Institute of Ecology and Environmental Management (CIEEM) and was delivered through grant funding from Community Foundation Ireland with further support from industry partners: APEM (Woodrow group), MKO, and Scott Cawley. The study provides an evidence base for the skills and capacity challenges affecting the Irish professional ecology sector and suggests actions to address this issue. The aim is to establish where skills gaps are most acute, identify the underlying drivers, and make recommendations for strengthening the workforce.

The report is intended for:

- **CIEEM and its members:** to inform professional development priorities and sector support activities.
- **Employers and practitioners:** to support consultancies, state bodies, local authorities, and NGOs with recruitment, training, and employee retention.
- **Higher education and training providers:** to improve alignment between training programmes, learning outcomes and applied, workplace requirements.
- **Policy and skills stakeholders:** Including relevant government and skills bodies, to support better coordination between labour market needs, education provision, and the distribution of funding mechanisms to support skill building.

# Research Approach

The study was conducted through a mixed-methods research approach which combined:

- **Desk-based research:** to understand relevant Irish policy, labour market and skills context, and to review existing sector initiatives and comparable approaches from other sectors where relevant.
- **Online survey (136 participants):** to gather perspectives across the sector in terms of the demand for skills, the supply of skills, and the factors which contribute to the capacity crisis.
- **Semi-structured interviews (14 participants):** to provide greater context, to understand the practical impacts of the capacity crisis, and to explore possible solution pathways in more depth.

Perspectives and insights from **three different cohorts** have been captured:

| | |
|---|---|
| Professionals | Individuals practicing in the sector (e.g., private consultancy, government, NGOs) |
| Academics | Individuals teaching in the sector (e.g., lecturers, professors) |
| Students | Individuals studying with a view to entering the sector (e.g., undergrad, masters, PhD) |

# PART 1 - CONTEXT

## The Ecology Sector in Ireland

Ireland's ecology and environmental management sector supports nature conservation and sustainable development across consultancy, public bodies, semi-state organisations, NGOs, academia, and private practice. Its professional remit includes providing statutory inputs for planning and development such as Environmental Impact Assessments (EIAs), Appropriate Assessments (AAs), and Strategic Environmental Assessments (SEAs), as well as delivering national and EU biodiversity reporting, habitat and species monitoring, and the implementation of biodiversity action plans, and management plans.

Ecological skills are an essential component of the wider green transition across renewable energy projects, peatland rehabilitation, afforestation schemes, flood-risk management, nature-based solutions, and green infrastructure planning.

## Growth Within the 'Green Skills' Sector

Global and national-level studies on 'green skills' and employment have lacked specific detail on the ecology and environmental management sector as the data on these narrower occupational groupings is typically too small for detailed statistical analysis[1]. Furthermore, ecology roles can be spread across different job titles and sectors, and this creates a challenge in gaining an in-depth understanding of the sector and its workforce. It is intended that this research will help to provide clearer insights into this specific sector in Ireland.

The global 'Green Economy' is driven by investment in infrastructure and assets that facilitate reduced emissions and pollution, provide greater resource and energy efficiency, and protect against the loss of biodiversity and ecosystem services[2]. While 'green jobs' and 'green skills' do not have a universal definition[3], there is extensive evidence to suggest that the green economy is expanding rapidly, and ecology and environmental management roles form part of this workforce. Analysis of 'Green Talent' across 43 countries compared Supply: *the increase in individuals with green occupations or green skills*, against Demand: *the increase in job postings searching for green talent*. Ireland ranked 9th in countries with the greatest workforce shortages across 2023-2024, with a 15.8% gap between supply and demand. The career categories analysed included roles which overlap with ecological practice such as ecosystem management, and environmental auditing or assessment [4].

At a national level, workforce analysis shows that in 2024, 75% of employment was associated with some level of green skills intensity, and that non-agricultural green employment saw an average annual growth rate of 6.4% between 2019-2024, a figure 3% higher than general employment growth [3]. Science & engineering and business & sales occupations were the greatest drivers of growth in green employment between 2019 and 2024, with increases of 9.1% and 8.5% respectively [3]. The sub-group within science and engineering which includes environmental and conservation specialists showed a 6% annual average employment growth from 2019-2024 [1]. Environmental and life science skills were shown to be in demand across a wide variety of sectors and cross-disciplinary roles including engineering, education, business, sales and IT [3].

Overall, growth within the 'green skills' sector has consistently exceeded the rate of general employment growth and this trend is likely to persist as the drive for a more sustainable, 'Green Economy' continues.

## Current Demand Within the Ecology Sector

Within the ecology sector, workforce demand has been exceeding capacity for several years. Research by CIEEM in 2022 found that many consultancies reported difficulty in filling staff vacancies due to shortages of experienced candidates and gaps in skills. Respondents noted that project delivery was affected, with some organisations declining work due to capacity constraints[5].

This capacity research project builds on the previous study. Findings from the 2025 surveys and interviews show that most participants (overall 82%) are aware of and affected by skills gaps.

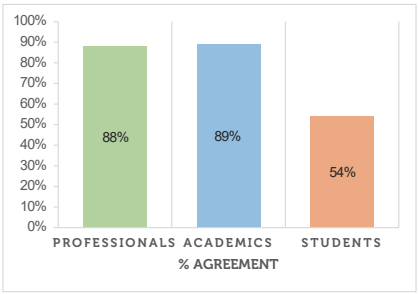
Within the professional cohort, 45% of respondents noted that their organisation is incapable of meeting project demand due to staff and skills shortages. Findings also show that the current project demand is high and within the professional cohort, this is driven primarily by assessment and compliance work for renewable, infrastructure, and other development projects alongside an increase in conservation and restoration work.

Interviewees outlined a range of tasks and skill competencies associated with the current demand:

**Professional Participant:**

"I'm turning away work on a weekly basis." (Private Sector Consultant)

"The ecology sector is affected by skills gaps"




| Projects Currently in Demand | Skills & Competencies Needed |
|---|---|
| Renewable energy; roads; utilities; housing; development; flood relief schemes; extractions; greenways; restoration; biodiversity action plans; compliance reporting (EU); Agri-environment; water quality. | Specialist habitat and species surveys; Environmental Impact Assessment (EIA); Appropriate Assessment (AA); Ecological Impact Assessment (EcIA); Preliminary Ecological Appraisal (PEA); ecological monitoring; report writing; restoration planning; site inspections; species ID; stakeholder engagement; project management; data analysis and interpretation; reporting writing; mitigation planning |

Respondents repeatedly pointed out factors such as staff shortages, high project load, recruitment challenges, and limited internal capacity to train early-career ecologists as immediate barriers to meeting the current project demand, and these are discussed in more detail in part two of this report. Such challenges contribute to a cycle whereby graduate roles often require further training and, in some instances, prior experience.

The interviewees noted a basic shortage of people with the right mix of skills and experience in specific applied competencies, most commonly: field skills, including species identification and survey competency; environmental assessment; policy literacy; and project management capabilities.

**Professional Participant:**

"We just don't have the people and haven't been training the people we do have quick enough" (Training Specialist)

## Increased Need for 'Green Skills'

Demand for ecological services is expected to grow and recent assessments of skills policy in Ireland identified the green transition as a significant driver of new and emerging skills needs. A 2023 *'Skills Strategy Ireland'* report by the OECD, with input from over 250 stakeholder representatives highlighted that new skills are needed to adapt to climate change and to address wider environmental challenges including global warming, biodiversity loss, and pollution[6]. The National Skills Council has also noted the importance of Green Skills as a focus of its work and future advice to government[7]. In addition, the National Training Fund includes increased funding of €1.485 billion over the 2025-2030 period to contribute towards improving national skills and general workforce capacity.

Specific ecology-related skills shortages have been identified across multiple sectors in Ireland. The SOLAS *Green Skills 2030* strategy identifies skill gaps in nature-based solutions, biodiversity, land management, nature restoration, ecosystem services, environmental science, and ecology across four of the seven economic categories which were

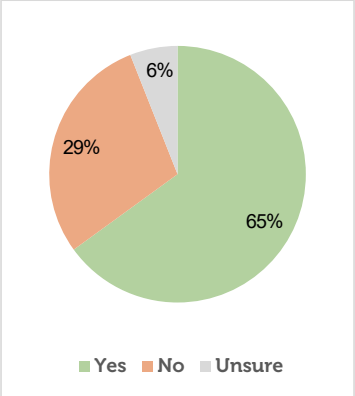
assessed[8]. These include construction, agriculture, forestry, tourism, and environment sectors. It demonstrates that demand for ecological expertise is being driven by increased environmental needs across the entire economic system, beyond traditional requirements.

Regarding pathways forward, SOLAS notes that achieving the national green transition is *"a cross-governmental endeavour incorporating extensive, multi-layered tasks which effect every economic sector"*[7]. The OECD report recommends making education and training provision more responsive to changing skills needs[5]. While insights from five recent Expert Group on Future Skills Needs (EGFSN) reports share common recommendations to meet increasing skills needs which include; collaboration between industry, government, and academia; apprenticeships and alternative training pathways; and the need for a responsive and agile education system[9].

## Future Demand Within the Ecology Sector

Survey and interview participants also anticipate that demand for ecological skills is likely to increase rather than stabilise. Ecologists also expect that skill needs will change in the future, with an increased demand for more general ecological experience (48%), alongside the need for anticipated new skills in AI and technology (27%); restoration knowledge (27%), and BNG capabilities (5%). Future demand for ecology services was noted as stemming from new policy requirements as well as the need to deliver projects to meet national targets across housing, renewable energy, and other infrastructure. Participants reported anticipated increases in demand for specialist skills in restoration techniques and monitoring, BNG assessment, data management, and for new roles like planning ecologists which would sit within the local authorities. Participants frequently mentioned the additional capacity requirements to meet the EU Nature Restoration Regulation targets and reporting needs.

"Do you anticipate the skill needs at your organisation will change in the foreseeable future?"




| Projects Expected to Increase | Additional Skills & Competencies Needed |
|---|---|
| Nature Restoration Regulation compliance; BNG type projects; construction phase ecological inputs; planning ecology roles | Restoration planning; habitat management; habitat assessment and BNG calculation; ECoW roles; licencing; compliance; monitoring; data management and analysis; planning legislation and impact analysis. |

As noted by the research participants, the requirements in current and forthcoming policy documents, will increase the demand for ecological inputs and will require significantly greater sector capacity.

Within planning and development policy, the updated National Development Plan includes an investment of €275.4 billion from 2026-2035 to *"unlock housing, upgrade water and energy infrastructure, deliver more roads, and provide better public transport"*[10]. These projects will require extensive ecological input and statutory procedures for environmental compliance such as AA Screening and EIA. The National Development Plan is underpinned by the National Planning Framework which sets out several objectives for nature and biodiversity including the requirement for Local Authorities to support the implementation of Ireland's Nature Restoration Plan, the requirement to use nature-based solutions, as well as objectives targeting the retention of existing habitats and the use of the mitigation hierarchy in statutory land use planning[11]. Similarly, the new Planning and Development Act 2024 provides for new National Planning Statements to guide proper planning and sustainable development. It is stated in the Act that these NPSs shall have regard to the protection of features of natural heritage and the integration of relevant policies and measures of the government relating to biodiversity, including those in respect of the National Biodiversity Action Plan[12].

**Professional Participant Re: New Development Plan:**

"those projects are large and complex in terms of the extent of surveying they need ... there is going to be an absolute shortage of skills, and a huge demand for large bodies of survey work and just not big enough field teams in Ireland to deliver on it"

Demand on the sector will also increase in response to targets and obligations for biodiversity and nature restoration under National and European legislation. The most recent NPWS reporting under the Habitats Directive (Article 17) found that 90% of protected habitats in Ireland are assessed as having Unfavourable conservation status (42% Unfavourable - Inadequate; 48% Unfavourable - Bad), with 51% showing deteriorating trends. Key pressures on nature at a national level include agricultural related activities, invasive species, recreational activities, and pollution[13]. Reversing this trend will require a sustained capacity for ecological survey, assessment, restoration planning and long-term monitoring.

In addition, the EU Nature Restoration Regulation, implemented by Ireland's Nature Restoration Plan, requires area-based restoration measures across land, sea, and urban areas, and includes binding targets for items such as protected habitats and species, peatlands, rivers, woodlands, pollinators, urban green space and tree canopy cover[14]. This will also create a significant workload for the ecology sector and related disciplines. Nationally, Ireland's 4th National Biodiversity Action Plan calls for a *"whole of government, whole of society approach"* alongside other key objectives for nature[15]. The NBAP was placed on a statutory footing in 2023 via the Wildlife (Amendment) Act. This introduced a duty for public bodies to have regard to the NPAB and to report to the minister on their operations in relation to the targets and objectives in the NBAP[16]. It means that an increasing number of public bodies will need ecological expertise embedded across their operations and decision-making.

**Professional Participant:**

"The scale of work that will be required to meet the requirements of the EU Nature Restoration Law will be enormous and put immense pressure on the sector" ... "I really don't think we have the capacity at the moment to address that; there just wouldn't be enough people at all levels of expertise."

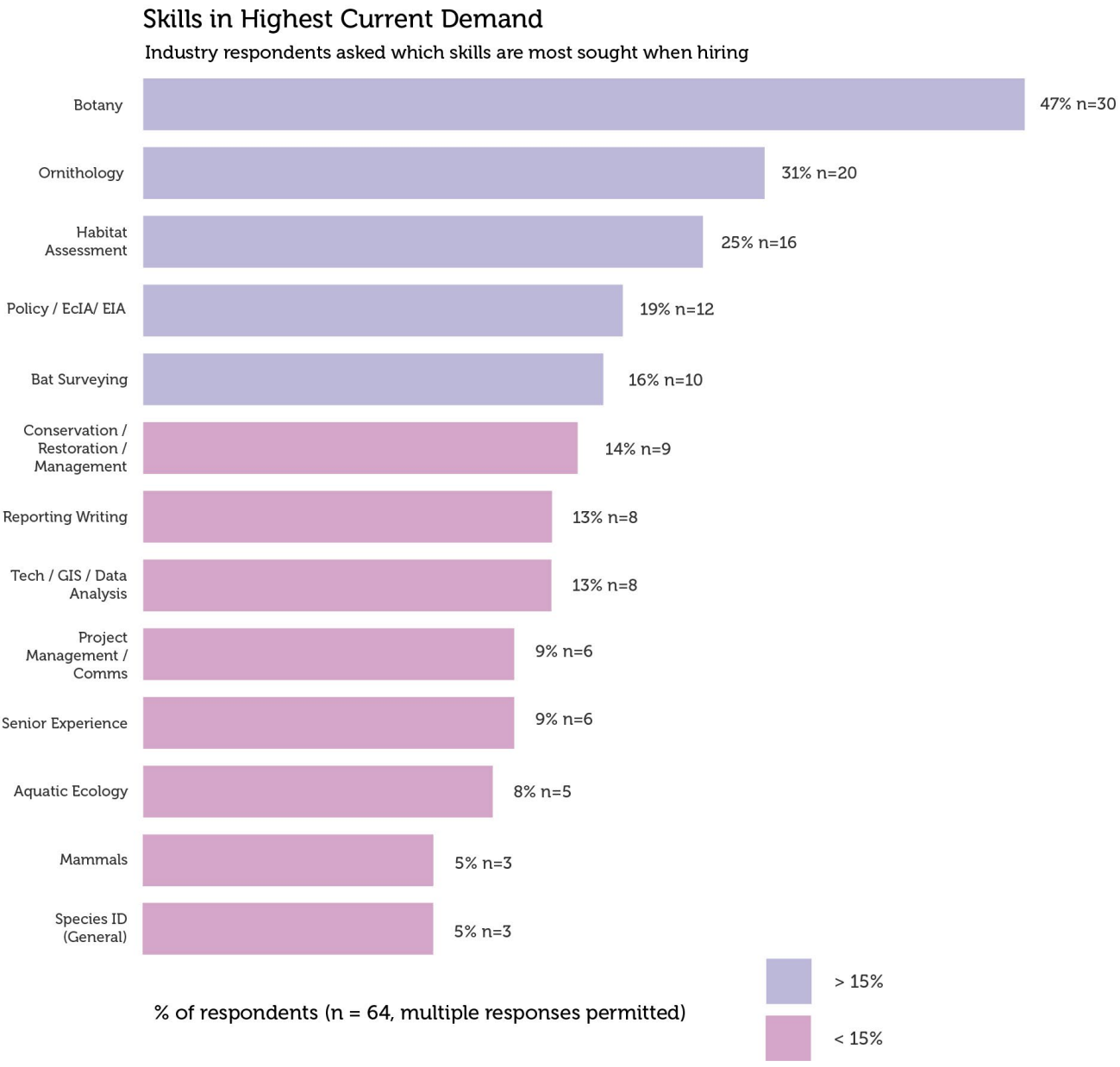
These requirements sit alongside a recent rise in both mandatory and voluntary biodiversity-related measures being taken by organisations across the public and private sectors. Through CSRD[17], in-scope companies are required to report on sustainability information, including biodiversity and ecosystems. At the same time, SBTN[18] and TNFD[19] are providing voluntary frameworks for nature-related target setting, assessment, and disclosure. This is likely to increase demand for ecological expertise, while also bringing new actors into areas traditionally led by ecologists.

Overall, the feedback from participants, and the requirements set out in existing and new policy documents, particularly those introduced over the past five years, indicates that the sector will need to increase its skills and capacity levels significantly to meet the demand and the targets set. A summary of the current and upcoming legislation and policy which typically requires ecological expertise is set out below:

| Year | Legislation / Policy | Context | Details / Targets |
|---|---|---|---|
| 1992 | Habitats Directive | EU | Habitat & species protection, restoration, and reporting |
| 2009 | Birds Directive | EU | Habitat & species protection, restoration, and reporting |
| 2014 | EIA Directive | EU | Assessment of impact of projects on the environment |
| 2018 | OPW Flood Relief | IRE | 94 Flood relief projects still to be completed |
| 2021 | Climate Action plan | IRE | 80% of energy from renewable sources by 2030 |
| 2023 | National Biodiversity Action Plan (NBAP) | IRE | *"Whole of government whole of society approach"* to restoring biodiversity. |
| 2023 | Wildlife Amendment Act | IRE | Public bodies must report on their operations in relation to the targets and objectives in the NBAP |
| 2024 | Planning and Development Act | IRE | National Planning Statements shall have regard to the protection of natural heritage, biodiversity, & the NBAP |
| 2025 | National Planning Framework | IRE | Use of mitigation hierarchy in land use planning and objectives for biodiversity and NbS in development |
| 2025 | Delivering Homes, Building Communities | IRE | Deliver 300,000 new homes by 2030 |
| 2025 | Nature Restoration Regulation | EU | Area based targets for habitat and species protection, restoration, and monitoring |
| 2026 | National Development Plan | IRE | €275.4 billion infrastructure investment from 2026-2035 |

## The Skills Gap

A central aspect of the capacity crisis is the skills gap within the sector. Participants repeatedly referred to a shortfall in the applied skills and competencies required to deliver standard professional tasks. To identify the areas of greatest need, the professional cohort were asked *"Are there specific skills in high demand at your organisation?"* The responses pointed overwhelmingly to a need for practical, field-based competencies such as botany (47%), ornithology (31%), habitat assessment (25%), and bat surveying (16%), alongside policy and EcIA/ EIA competency (19%).




To identify priorities across the full range of ecological skills, categories were derived using the CIEEM competency framework. The professional cohort were asked which of these skill areas are most in demand and which are most commonly lacking in new employees. This was completed for both technical and transferable skill sets.

It is important to distinguish between skills that are most in demand and those that are most commonly lacking when assessing the sectoral skills gap. High-demand skills may indicate a need to increase overall capacity in those areas, whereas commonly lacking skills suggest deficits in training, education, or professional development. While both are related, they may require different types of responses when taking action to build sector capacity.

## TECHNICAL SKILLS

| Which **technical skills** are most in demand when hiring new environmental employees? | Of these **technical skills,** which are most commonly lacking in new employees? |
|---|---|
| 1. Environmental Assessment<br>2. Critical thinking & Scientific Approach<br>3. Field Surveying<br>4. Policy & Legislation<br>5. IT Software Proficiency<br>6. Knowledge Sharing & Dissemination | 1. Field Surveying<br>2. Policy & Legislation<br>3. Environmental Assessment<br>4. Critical thinking & Scientific Approach<br>5. IT Software Proficiency<br>6. Knowledge Sharing & Dissemination |

Within the technical skills, demand and deficiency do not align across all skill areas. Field surveying is the clearest skill gap, followed by policy and legislation, and environmental assessment. Conversely, critical thinking and scientific approach is shown more highly in demand than in deficiency, which suggests these are important skills but do not appear to be acutely lacking in new employees.

## TRANSFERABLE SKILLS

| Which **transferable skills** are most in demand when hiring new environmental employees? | Of these **transferable skills,** which are most commonly lacking in new employees? |
|---|---|
| 1. Communication & Report Writing<br>2. Project Management<br>3. Stakeholder Engagement & Teamwork<br>4. Professional Work Approach<br>5. Information Management (Data)<br>6. Health & Safety Competency<br>7. People Management<br>8. Organisational Management | 1. Communication & Report Writing<br>2. Project Management<br>3. Stakeholder Engagement & Teamwork<br>4. People Management<br>5. Information Management (Data)<br>6. Professional Work Approach<br>7. Health & Safety Competency<br>8. Organisational Management |

The transferable skill analysis shows greater alignment with communication and report writing, project management, and stakeholder engagement shown as both high in demand and as lacking in new employees.

These technical and transferable skills, particularly those shown to be in high demand, are essential for day-to-day professional ecology work. Where these skills are underdeveloped or absent, organisations can struggle to win new contracts, complete projects on time, and deliver work to a high professional standard.

## Professional Practice Context

The skills gap points most directly to a professional practice capacity crisis. The greatest pressure is in field survey, assessment, reporting, and project delivery, where organisations must recruit, train, and retain staff to meet immediate demand. Other parts of the wider ecology sector, including academia, may not experience these pressures in the same way or to the same extent. However, they are clearly connected to the issue and have an important role in longer-term sector development. The response therefore cannot be framed solely around academic courses or graduate outputs; it must be considered across the wider ecology sector and against where current and future demand is most acute. This is particularly important in a profession that has expanded significantly in recent years, and where roles increasingly require a broader and more complex mix of skills and competencies.

Concerns about weaknesses in field competence have also been identified beyond this study. In 2025, the British Mammal Society coordinated a cross-sector letter warning that students and graduates are losing opportunities to develop field skills, and that employers are increasingly encountering entrants who need additional shadowing and support before they are ready for practice[20]. Wider literature has similarly shown that declining field experience can weaken species identification, biodiversity monitoring, ecological understanding, and environmental stewardship, with implications not only for the profession, but for biodiversity outcomes more broadly[21]. Building capacity must be considered in broader terms, shaped both by the practical demands of professional ecological work and by the wider risks that low-capacity poses to the sector and to nature itself.

# PART 2 - FINDINGS

## Drivers of the Capacity Crisis

The research shows that a number of key issues are driving the capacity crisis. These relate to challenges in skills and training, in how people enter the profession, how they progress and build experience once hired, and how organisations retain staff over time. External factors, such as project workflows and timelines also create additional pressure on the sector. The themes below emerged through survey and interview responses from participants across the professional, academic, and student cohorts. Quantitative and qualitative analysis revealed barriers to increasing capacity in the sector, while respondents also suggested possible solutions.

**Professional Participant**

"There is an unprecedented skills shortage within the ecological sector due to increased workload and individuals graduating from degrees which lack training within relevant areas e.g. environmental legislation, specialist field skills, relevant reporting."

The key drivers of the capacity crisis fell into 4 **main themes**:

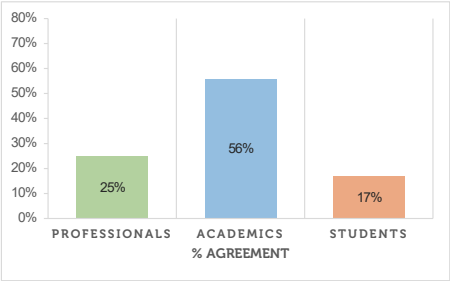
| Driver | Details |
|---|---|
| **Skills and Training** | A lack of skilled and trained individuals to undertake work |
| **Career Entry** | Challenges within entry pathways to careers in ecology |
| **Career Progression** | Challenges in building experience, and role progression pathways |
| **Working Conditions** | Salaries, hours, and workload, alongside systemic issues within projects, development teams, and policy |

## Barrier Theme 1: Skills and Training

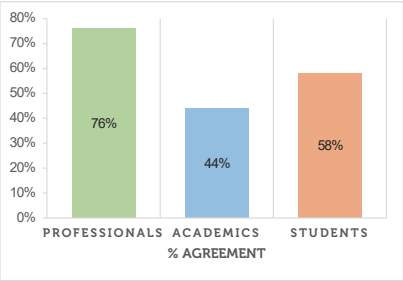
This theme relates to shortages or misalignments across skills and training and was the most significant and frequently noted driver of the capacity crisis, mentioned in 40% of all responses. Key aspects of this barrier include university stage education as well as upskilling and retraining needs.

**Academia – Profession Misalignment:** Participants in the professional cohort emphasised that the ecology workforce is under considerable pressure, and a significant factor is a persistent gap between the skill level of graduates entering the workforce, and the skills employers need to fill roles. Survey and interview participants repeatedly described a disconnect between the content and emphasis within academic programmes and the applied requirements and realities of entry-level professional roles in consultancy, the public sector, and NGOs. The statements below reflect the views of all research participants regarding the relationship between academic courses and professional practice.

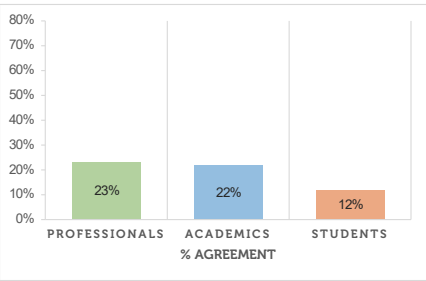
"Undergraduate courses in Ireland teach graduates the requirements for entry-level roles"




"Academia is too focused on teaching students conceptual theories, rather than practical skills"




"Communication between academia and industry is adequate"

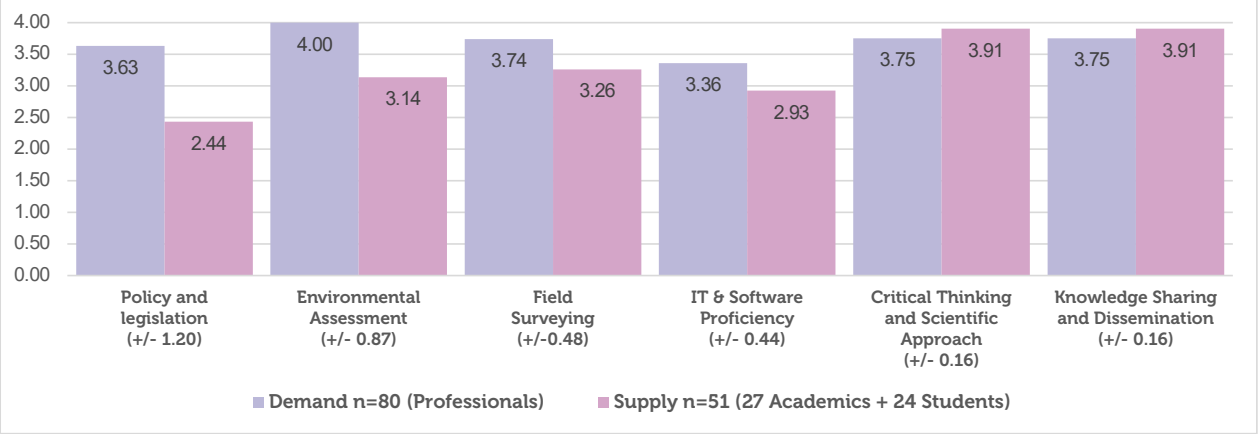


Comparing the skill priorities between professionals, academics, and students, gives insight into the misalignment of skills and the shortfall reported by professionals when hiring new graduates. The table below ranks **technical skills** in order of priority across the cohorts:

| Professional Cohort<br>Skills most in demand when hiring new employees | Academic Cohort<br>Skills most prioritised in curriculum learning outcomes | Student Cohort<br>Skills most emphasised in college course teaching |
|---|---|---|
| 1. Environmental Assessment | 1. Critical thinking & Scientific Approach | 1. Critical thinking & Scientific Approach |
| 2. Critical thinking & Scientific Approach | 2. Field Surveying | 2. Knowledge Sharing & Dissemination |
| 3. Field Surveying | 3. Knowledge Sharing & Dissemination | 3. IT & Software Proficiency |
| 4. Policy & Legislation | 4. Environmental Assessment | 4. Environmental Assessment |
| 5. IT Software Proficiency | 5. IT & Software Proficiency | 5. Field Surveying |
| 6. Knowledge Sharing & Dissemination | 6. Policy & Legislation | 6. Policy & Legislation |

Across all three, critical thinking and scientific approach ranks highly, showing broad consensus on its importance. Divergence is more evident across the applied technical skills. The professional cohort places greatest emphasis on environmental assessment, with field surveying and policy & legislation also ranking highly, whereas these are given lower priority by the academic and student cohorts. Despite field surveying being high priority for academic learning outcomes, students perceive it as being of low emphasis in teaching. In contrast, knowledge sharing & dissemination and IT & software proficiency rank as higher priority among academic and student cohorts than among professionals.

By combining the academic and student responses to represent the 'supply' of skills and comparing these with the professional responses which represent the 'demand' for skills, areas of imbalance between the skills needed for professional practice and the skills prioritised in academic courses can be identified.




The largest **technical skills** gap between 'supply' and 'demand' is seen in policy and legislation, followed by environmental assessment. Field surveying and IT & software proficiency show moderate misalignment, while critical thinking & scientific approach and knowledge sharing & dissemination receive greater emphasis on the 'supply' side than on the 'demand' side. However, even where the supply-demand gap is smaller, this does not necessarily mean that competence is being developed to the level required in practice. Field surveying was identified by the professional cohort as the technical skill most commonly lacking in new hires, and qualitative feedback repeatedly stressed a lack of field skills among graduates. Similarly, critical thinking and scientific approach appears broadly aligned across cohorts but was still reported as lacking by a considerable proportion of professionals. Also notable is that students ranked policy & legislation lowest, suggesting that its relevance to the

**Professional Participant:**

"Most graduates have poor field identification skills and no practical conservation skills at all."

**Professional Participant:**

"The key skills lacking in the undergrads are critical thinking around EIA and AA"

profession is not coming through strongly in teaching. If students are leaving programmes without a clear sense of its importance, this points not only to a gap in skills development, but also to a misalignment in how graduates understand the demands of professional ecology.

A similar pattern is evident for **transferable skills.** This largest 'supply' and 'demand' gaps are seen in project management, stakeholder engagement & teamwork, and people management. Communication & report writing was ranked highly across all three cohorts; however, practitioners identified it as the most commonly lacking transferable skill in new hires, followed by project management. Again, this suggests that coverage within higher education does not necessarily translate into the level of competence needed in professional roles.

**Student Participant:**

"My undergraduate degree did not at all prepare me for a career within an environmental consultancy"

Overall, these findings show that the issue is not only which skills are included in academic programmes, but how effectively they are taught, applied, and reinforced. Skills may be incorporated into courses, but this does not necessarily mean that graduates leave with the confidence or practical competence to use them in an applied professional setting. Therefore, a relatively modest gap between academic 'supply' and professional 'demand' should not be taken to mean that the sector has sufficient provision of that skill area. The findings suggest a disconnect between academic preparation and the applied demands of professional ecological work. For example, a high-level review of environmental and ecology degree courses in Ireland showed that the majority teach Environmental Impact Assessment, and frequently these are mandatory modules. However, 37% of professionals noted this skill as lacking in new employees. It demonstrates that simply including these topics on courses is not enough, and is supported by qualitative data across all cohorts, most notably from professionals and students. This negatively impacts both the professional sector as they seek to build capacity and the students when they graduate and begin applying for jobs.

**Professional Participant:**

"Despite having a PhD, the role I ended up in is technically considered "entry level". I feel very strongly that my PhD did not prepare me to work in industry and that my experience in conducting research as a PhD is not valued by industry. There is a serious disconnect there. The role I am currently in, while technically being entry level, I think would be overwhelming for a recent undergraduate graduate"

**Future Teaching Priorities:** Academics and students were asked *Are there skills or competencies you would like to see included in environmental courses that are not currently taught?* Both cohorts identify curriculum gaps, and responses, particularly from students align quite closely with what the professional cohort has emphasised is needed.

| Future Teaching Priorities<br>Academic Cohort |
|---|
| 1. IT Skills (R, Python, GIS)<br>2. Report Writing<br>3. Fieldwork & Practical Surveying<br>4. Policy & Legislation |

| Future Teaching Priorities<br>Student Cohort |
|---|
| 1. Fieldwork & Practical Surveying<br>2. Environmental Assessment<br>3. Report Writing<br>4. Policy & Legislation<br>5. IT Skills (R, Python, GIS)<br>6. Project Management |

**The Role of Degree Courses:** It is important to consider whether university courses should be expected to prepare students directly for professional practice, or whether capacity-building efforts should place greater emphasis on post-graduate and alternative training pathways. Interviews undertaken as part of this study give insight into how perspectives differ between the academic and professional cohorts. Both parties seem to be highly aware of the gap, however the best way to address it is less clear.

**Academic Participant:**

"I think there's a mismatch between what industry wants and what degrees are meant to do, which is give people a broad range of skills, and a solid background knowledge in ecology. Much of that knowledge not being directly relevant to what industry wants. They actually have a relatively narrow view, I think, now that's not to say that there isn't scope for making them; making new degrees more focused on industry. I would be curious to know what industry think about this, the basic skills that they feel their graduate should have. I mean, if you do an ecology degree, you don't do an ecology degree on birds. You do it on animals and plants. Therefore, you cannot be an expert in all of these things."

**Professional Participant:**

"most undergrad courses are teaching people topics and modules which are not practical or relevant to the industry and the practice that's followed. So, they're not coming out with basic field identification skills, taxonomy skills. Or a basic understanding of impact assessment and the legislation around planning, the wildlife acts, and the birds and habitats directives. So, when they come out of university, basically they are coming in with zero knowledge, and they have to learn everything on the job. So, it's challenging for them because they feel out of their depth and it's challenging for employers, because they have to put a huge amount of investment and time into training people up before they get to a basic level of competence, really. There are standouts from Tralee wildlife biology, but they then lack that scientific background that you get from a UCD or Trinity student"

As previously stated, this study primarily identifies a professional capacity crisis, rather than an academic one. Undergraduate science degrees are broad by design, aiming to develop scientific understanding and analytical ability rather than advanced competence in a single applied profession. Many graduates from these programmes go on to careers outside ecology, so expecting general undergraduate degrees to consistently produce industry-ready ecological practitioners may be unrealistic. Bridging that gap is therefore likely to require input from multiple stakeholders, including employers, professional bodies, higher education institutions, and post-graduate training providers.

The findings therefore point to a misalignment between the skills and competencies emphasised in academic teaching and those required in professional ecological work, rather than a failure within the academic system. Academic staff are clearly committed to preparing students for future careers, but professional ecology has changed rapidly in recent years through evolving legislation, policy requirements, and expanding expectations around ecological assessment, planning, and restoration. It is therefore understandable that university teaching and graduate competencies may struggle to keep pace, particularly where programme structures and resources are constrained.

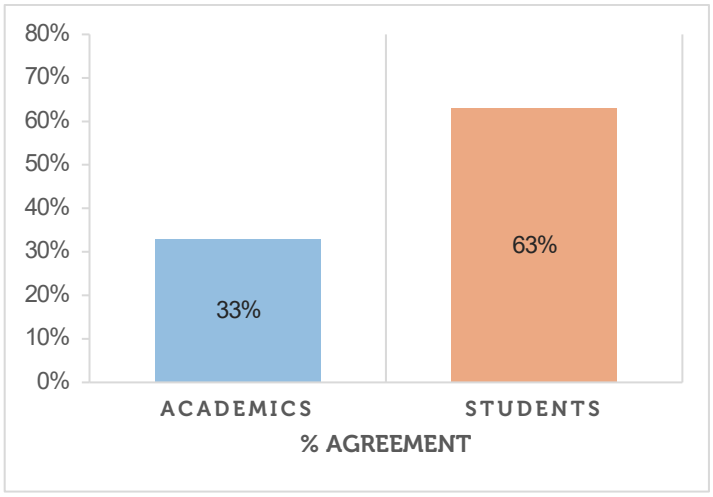
**Academic Participant:**

"I think for us it comes down to time and funding. We had an MSc in the past which was run for many years, and the coordinator had to give it up due to other academic responsibilities. People always ask me what happened to that course as it produced a lot of industry ready graduates, but ultimately it couldn't be run any longer"

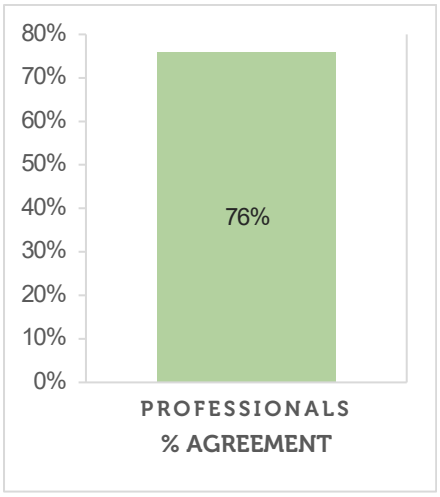
More broadly, the results suggest that academic and professional ecology in Ireland currently operate with limited coordination. This is visible not only in the graduate competency gap identified here, but also within research agendas, methodological approaches, and training structures. In more mature professions, such as medicine, engineering, or law, there is a clearer relationship between academic training and professional practice. Ecology in Ireland does not yet appear to have an equivalent applied framework oriented towards professional methods, practice-ready training, and innovation in direct dialogue with the sector. As the ecology profession continues to expand in response to biodiversity, restoration, infrastructure, and climate-related demands, this disconnect is likely to become more significant if not addressed.

**Upskilling:** Participants across all cohorts felt that additional training is often needed before graduates are ready to secure an entry-level role in professional ecology. In practice, some rely on further study, short courses, voluntary experience, or unpaid work to bridge this gap, although these routes are not accessible to all.

"Postgraduate studies are necessary for graduates to meet entry-level requirements"




"Structured internships or apprenticeships are necessary for graduates to meet entry-level requirements"




This raises a wider question about where professional preparation should sit. It may be appropriate to strengthen post-graduate and early-career training routes, particularly where undergraduate degrees are broad by design. However, there may also be a case for introducing more profession-focused pathways earlier, for example through an applied final-year specialism in ecological practice. This could reduce reliance on additional qualifications after graduation, while retaining the broader academic basis of undergraduate study.

**Solutions – Skills and Training:** Suggested solutions focused on reducing the gap between academic preparation and the applied competencies needed in professional ecology, while also improving access to ongoing training for those already working in the sector. Across the findings, the issue was not simply a lack of teaching, but a lack of consistently applied, practice-oriented learning in areas such as field surveying, policy and legislation, environmental assessment, report writing, and project delivery. Respondents therefore pointed to a combination of shorter-term measures, such as increasing placements, creating feedback loops between universities and industry, and targeted training, alongside longer-term structural changes to how professional ecology is taught and supported.

**Professional Participant:**

"There needs to be greater scope for apprenticeships in certain field skills, greater mentoring programmes, internships throughout college, and placement. Practical skills, common sense and the ability to work professionally within an organisation only comes with time in the field/workplace."

A recurring theme was the need for a more formal interface between academia and the profession. In more established professional sectors, including medicine, engineering, and law, academic training is more closely tied to practice through structures such as professional schools, teaching hospitals,

accredited degree pathways, embedded placements, practitioner input into curriculum design, and applied research agendas shaped by sector needs. In Ireland, industry-academia collaboration is already well established in sectors such as biopharma, med-tech, and ICT, with over 1,700 active collaborations between universities and industry, involving more than 1,000 multinationals and 700 SMEs, supported through mechanisms such as Research Ireland and Enterprise Ireland. The National Institute for Bioprocessing Research and Training (NIBRT), for example, was created as a university-industry partnership to deliver workforce training and applied research directly aligned with the needs of the biopharma sector, while ICT research centres such as LERO, Insight, and ADAPT operate through similar multi-university, industry-informed models. An equivalent for ecology, would mean a more structured academic-professional partnership through which the sector helps shape postgraduate teaching, placements, applied research, and continuing training.

Another solution could take the form of a professionally oriented MSc in ecological practice, co-designed with the sector and built around the CIEEM competency framework; structured summer placements timed to peak survey season; stackable micro-credentials in areas such as GIS, BNG, habitat assessment, or policy interpretation; and applied research focused on the day-to-day needs of practice, such as survey methods, assessment tools, mitigation effectiveness, and legislative change .

**Academic Participant:**

"We need to repeatedly persuade the university management that this is a real skills gap, that there's a genuine, definite jobs market out there for graduates."

Beyond university pathways, participants noted the need for more training and a more accessible upskilling ecosystem for professionals already in the sector. In the professional cohort, 96% of respondents agreed that training courses would help to fill the skills gap. Respondents suggested additional Irish-based, practical, field-led training opportunities that are regionally accessible and affordable for early-career practitioners, alongside targeted training in professional practice skills such as tendering and project management, particularly for those progressing into senior roles without structured support. A small number of participants highlighted the risks of smaller scale training provision, and that it may lack the depth to truly address the skills deficit. One response stated, *"I think 1-day courses are not detailed enough to provide the structured thinking needed to address the issues".* It is important that additional training is designed in a targeted way to address a specific skill need with clear learning outcomes.

**Participant Suggestions**

Strengthen collaboration between universities, employers, and professional bodies so that curricula, teaching, and assessment reflect current legislation, survey standards, reporting practice, and sector needs.

Increase applied learning within degree programmes, including professional-style assessments, supervised placements, and internship models designed around clear learning outcomes and meaningful responsibility.

Review course learning outcomes and feedback mechanisms more regularly, using structured input from employers, recent graduates, students, and alumni to keep teaching responsive to changing sector needs.

Expand professionally oriented pathways alongside broader academic degrees, including practice-focused postgraduate and conversion routes with substantial fieldwork, applied assessment teaching, and placement as core components.

Expand the upskilling ecosystem for graduates and practitioners through accessible Irish-based practical training, targeted CPD, and stackable micro-credentials linked to identifiable competence needs.

Explore a more formal academic-professional partnership model for ecology in Ireland, including co-designed postgraduate training, applied research, and shared investment by universities, industry, professional bodies, and public funders.

## Barrier Theme 2 – Career Entry Pathways:

Challenges with entry pathways into ecology are contributing to capacity pressures across the sector. Participants identified barriers arising at multiple stages, from school-level awareness through to securing an initial professional role.

> **Professional Participant:**
>
> "There are limited avenues into the industry outside of third level institutions, which in turn limits career change opportunities. Also, a lack of knowledge at second level as to the potential career opportunities"

**Early Awareness:** Participants noted that ecology is poorly signposted as a career at second level, with limited awareness, career guidance, and visibility around the profession and its entry routes. While nature and biodiversity may be encountered through primary and second-level environmental education, this does not necessarily lead to an understanding of ecology as career option. As a result, students may reach key decision points without a clear sense of the roles available or how to access them. Similarly, student responses noted that third-level environmental courses often emphasise lab-based careers, such as microbiology and biochemistry, without clearly highlighting ecology as a distinct professional pathway, or explaining the opportunities and competencies associated with it. As a result, ecology roles may be overlooked entirely by some third-level students due to lack of awareness.

> **Student Participant:**
>
> "I honestly do not know how I would like my career to progress. I am not sure if I want to stay in academia or move on to possibly an NGO or government agency. I do not think I want to go to environmental consultancy"

**Career Options:** Participants also noted a disconnect between the career pathways promoted within higher education and those understood by students themselves. Universities were described as tending to encourage academic progression, and only 46% of students reported that they were aware of employment opportunities in the environmental sector outside of academia. 29% of students stated that they feel unaware of their options. Regarding career pathways, 47% of students expressed a preference for continuing within academia through a masters, PhD, or other postgraduate route, compared with 27% who expressed an interest in private consultancy and 20% who mentioned public or NGO roles. This contrasts with the academic cohort response to the question, "*What career progression is targeted for graduates of ecology courses within your university?*", where 79% of responses mentioned environmental consultancy careers. The difference between these responses suggests that intended progression pathways are not being communicated clearly to students. Less than half feel they understand their options, and there is considerable uncertainty around career direction.

> **Professional Participant:**
>
> "It is very difficult to get an entry-level job with no experience after college"

**First Roles:** Although 64% of professionals stated that their organisation has capacity to train graduates on the job, many participants also noted the difficulty of securing a genuine entry-level role without prior experience. Some graduates therefore rely on unpaid or voluntary work to gain experience, however this further narrows access to the profession, as it is not feasible for all candidates. The issue was often framed as a mismatch between the skills employers need immediately and the time and cost required to support new entrants. The result is a limited supply of true entry-level roles and a difficult transition for graduates into professional practice.

**Alternative Entry Routes:** Outside of third-level education, alternative routes into ecology were seen as limited. This restricts access not only for those who cannot pursue university education, but also for career changers, including people moving from related disciplines or sectors. In practice, this means that entry to the profession is still heavily dependent on formal academic pathways, with few flexible or clearly defined alternatives, such as apprenticeships, conversion courses, or structured routes for those transferring from related fields. Participants suggested that this narrows the potential recruitment pool and may exclude people who could otherwise bring relevant experience to the sector.

**Career Entry Pathways - Solutions:** Suggested solutions focused on creating clearer and better supported routes into employment in ecology. There were also suggestions for improved nature-education and better promotion and signposting of ecology as a career, from school level through to graduate entry.

Respondents placed particular emphasis on greater integration of structured work placements within degree programmes, while also highlighting the importance of their design, duration, and accessibility. A review of undergraduate and postgraduate environmental and ecology courses in Ireland showed that placements are already offered on many courses, but these are often optional, secured on a competitive basis, short in duration (4-6 weeks), and spread across a wide range of host sectors. This suggests that current placements may help students explore career options but are not necessarily designed to support entry into the professional ecology sector or to deliver learning outcomes linked to professional practice.

**Professional Participant:**

"We need, apprenticeships, internships and grad programs to support more entry into the into the industry. I think we need non-academic routes, like apprenticeships. There are lots of people in spaces like forestry, horticulture, maybe agricultural areas, who have decided they want to change career and would like to move into ecological consultancy, but they're never going to go back and do a four-year degree and a masters ... we need faster practical courses for people like that. A one-year diploma or something that's part time while they're working."

Paid internships and graduate programmes were also highlighted as important routes to support transition into the profession after graduation. Apprenticeship-style and other learn-on-the-job pathways were frequently proposed as a way to widen access to ecology careers, particularly for mature entrants, career changers, and those for whom full-time study is not feasible. Respondents also noted that other sectors have developed the structures and capacity to facilitate placements and apprenticeships more routinely, and that similar mechanisms may be needed if ecology-specific placements are to expand. Across these routes, participants noted that employers, particularly SMEs, may require financial or practical support to provide such opportunities and train new entrants.

**Participant Suggestions**

Develop clearer and more structured routes into employment in the ecology sector.

Strengthen nature education in schools and promote nature-based and green careers including through transition-year opportunities and second-level career guidance.

Improve career guidance and pathway mapping for students, graduates, early-career professionals, and those seeking to transfer from other sectors.

Introduce more structured work placements into degree programmes focussed on applied learning and 'industry-style' outputs, to replace or compliment the traditional thesis.

Expand paid internships and graduate programmes to support transition into the profession.

Develop apprenticeship-style and other learn-on-the-job pathways to widen access for mature entrants and career changers.

Provide financial and practical support to employers, particularly SMEs, to help them facilitate paid placements, internships, apprenticeships, and graduate training.

## Barrier Theme 3 - Career Progression:

Challenges with career progression are shaped by sector constraints which inhibit career development or upskilling, and also by how the profession has changed over time, and by what career progression means in practice.

**Capacity Constraints:** While 64% of responses in the professional cohort stated that their organisation can train graduates on the job, participants also noted that a limiting factor to career progression is the lack of *"technically experienced mentors, trainers, or managers to provide the training and oversight required"*. Many respondents highlighted that there are *"huge number of graduates and not enough staff with capacity to adequately train them"*. In consultancy in particular, senior staff were described as carrying heavy workloads, which limits time for supervision and mentoring of junior employees. This slows the rate at which junior staff can take on responsibility and contribute more fully to organisations.

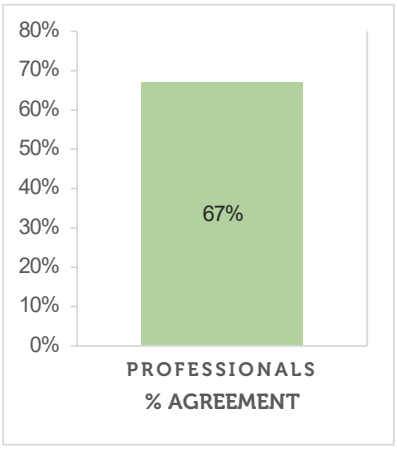
**Professional Participant:**

"lack of supports for professional growth. Too much work to allow time for upskilling existing staff"

Only 51% of respondents stated that their organisation is effective at retaining skilled individuals. A lack of time and support across all staff levels to undertake external or additional training was also reported. However, in contrast, 77% of responses stated that their organisation facilitates upskilling or reskilling opportunities, suggesting that the main constraint may be less about access to training and more about workload, staffing capacity, and time availability in practice. Ecologists working in individual roles, such as biodiversity officer posts, also noted that these positions can be contract-based, isolated, and lacking in clear hierarchical structures for supervision and career development.

**Reluctance to Progress**: An equal, if not greater, issue is the reluctance of staff, particularly in consultancy, to progress to more senior roles. When asked why career progression might not be attractive, 60% of responses in the professional cohort stated that they would not want to give up the fieldwork aspect of their job. This appears to reflect the reality of progression in the sector, as 67% of professionals surveyed stated that they use their field skills less as their career advances.

"I use my field skills less as my career has progressed"




A further 35% of responses stated that the working conditions associated with more senior roles make progression unattractive. Respondents referred to the shift towards predominantly desk-based work, greater emphasis on administration and people management, and associated long hours, pressure, deadlines, and stress. Multiple participants also noted discomfort with the scope of more senior work, particularly where outcomes for nature can sometimes be compromised by project and client needs. CIEEM's State of the Profession Survey found that retention is now as important and as challenging as recruitment, with employers under pressure to promote staff before they are fully ready, creating risks for both quality and workforce sustainability[22].

**Research Participant on reluctance towards career progression:**

"Too much focus on client or project requirements rather than ecological protection. Commercial pressures and pressures of difficult deadlines. Shortage of suitably qualified staff. Salary not matching job requirements or hours of work"

**Skills in Senior Roles:** Ecologists are typically not formally trained as project and people managers, and this type of work differs hugely from how the career is experienced at university and during the early stages of employment. There is therefore an understandable disconnect between the technical skills needed for a field-based ecology role, and the softer skills required to engage with multi-disciplinary teams, and project stakeholders. Within consultancy, senior ecology roles often require competence across three linked skill sets:

1. **Field surveying and technical ecology**
2. **Impact assessment and report writing**
3. **Project management and leadership, including client and stakeholder engagement**

However, this requirement can be unrealistic, both in terms of competency development and individual career ambitions. As the results suggest, it can hinder progression for field ecologists who wish to remain in technical roles, and equally for strong report writers or managers who cannot, or do not wish to, undertake fieldwork.

**Project Structures:** The current progression model that requires strong all-rounders and moves ecologists away from field-based work as they progress, is driven in part by the growing scale and complexity of ecological projects. Senior roles increasingly require coordination, interpretation, complex reporting, and client and stakeholder management alongside technical ecological input. Interestingly, respondents noted that clients will readily pay for data collection and fieldwork but tend to undervalue management and data analysis or interpretation work. However, these latter functions are essential to producing robust impact assessment, reporting, and enabling projects to progress through planning and consent processes.

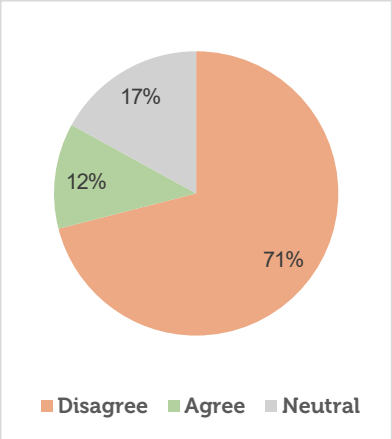
**Professional Participant:**

"We need to educate clients that to deliver ecology work on complex infrastructure projects, you have to pay for the value we're adding in understanding how to interpret that data and turn it into an impact assessment and a report that will get the project through planning."

The scale and complexity of upcoming work needed to meet biodiversity, infrastructure, and development objectives will require ecological teams with a broader range of competencies. This will need to be better understood by both public and private sector clients. Although recruitment from other disciplines may form part of the solution, only 12% of survey participants felt that project managers with little or no environmental sector experience could successfully manage an ecological team.

Career progression pathways will therefore need to evolve to reflect the range of roles required within the sector, and to support ecologists in planning and training for more senior positions.

"A project manager with little/no experience in the environmental industry could manage a team in my organisation"




**Solutions:** Suggested solutions focused on improving career development, retention, and progression within the sector. Respondents emphasised the need for clearer and more consistent support for early- and mid-career staff, including structured development opportunities, mentoring, and formal programmes that combine office-based learning with site-based experience. More fundamentally, the wider findings suggest that ecological work has become too broad and complex for senior progression to rest on a single all-round role.

**Professional Participant:**

"The sector needs to provide different career routes and pathways for people, where somebody can say, I never want to be a project manager. I never want to be dealing with clients or the public. I just want to be doing surveys and very technical ecological work, and for them to be able to progress in seniority and experience and be rewarded for that. And then, on the other hand, I think we need to allow for people who never want to be out doing field surveys."

Project demands have expanded to include increasingly complex requirements for planning, assessment, technical survey design, reporting, coordination, and practical restoration. Respondents highlighted the need for more formal distinctions between senior technical roles and senior project roles, so that ecologists can progress, specialise, and be suitably rewarded without being forced into a single model of seniority.

**Participant Suggestions**

Provide clarity on career development opportunities, with structured support and clear career benchmarks for early- and mid-career staff.

Develop formal early-career programmes that combine office-based learning, site-based experience, and mentoring from experienced practitioners.

Retain junior, mid-level, and highly experienced staff in the sector as a core part of capacity-building.

Support and recruit experienced ecologists to train and mentor others.

Establish more formal progression pathways that allow staff to upskill and progress without defaulting into management roles.

Recognise and reward distinct senior pathways, including a technical specialist route and a project management, assessment, and reporting route.

Ensure clients better recognise the value of interpretation, assessment, and reporting, alongside survey and data collection.

The table below suggests how senior-level career progression could be set up through two possible pathways: a technical specialist route and a managerial / project ecologist route.

| | Field Ecologist / Technical Specialist | Managerial / Project Ecologist |
|---|---|---|
| **Strengths** | Ecological survey skills and taxonomic competence; field methods; data quality and interpretation; habitat and species knowledge; practical mitigation, monitoring, and restoration measures. | Project planning and delivery; coordination across disciplines; client and stakeholder management; translating ecological requirements into clear scopes, programmes, and deliverables; understanding planning and consenting processes. |
| **Motivations** | Preference for fieldwork, specialist surveys, and technical depth; interest in survey quality, evidence, and long-term monitoring. | Preference for coordination, leadership, and problem-solving; interest in delivery, project integration, and working across teams and stakeholders. |
| **Project Value Add** | Produces robust baseline data and survey evidence; supports impact assessment, mitigation, monitoring, and technical review; maintains technical quality and credibility. | Integrates ecology into project design and delivery; manages programmes, interfaces, risks, and resources; translates survey findings into reporting and advice for planning and compliance. |

## Barrier Theme 4: Working Conditions

This theme relates to factors from both within and outside the sector such as pay, hours, and project pressures which influence the working conditions of professional ecologists. These can in turn either directly or indirectly impact capacity within the sector.

**Employment factors:** Pay was frequently raised as an issue, typically in reference to individual salaries, but also in a broader sense. There was a feeling from several participants that ecology as a discipline is underpaid relative to the level of responsibility and value it delivers: "*ecologists are vital to environmental and EIA projects yet are underpaid relative to project value*". The attraction of better pay was also noted as a factor for ecologists who leave the profession or move to work in other sectors. CIEEM's State of the Profession Survey 2025 reported that the mean annual full-time salary in Ireland was above the overall CSO full-time average, but below the CSO average for Professional and Technical occupations[22]. Collective market forces and the overall value of the ecology sector will inevitably support or limit the rate of individual salaries. Respondents referred to long hours during survey season coupled with a lack of clear mechanisms for time off in lieu or compensation as adding stress to the profession. This also aligns with CIEEM's findings that 60.0% of permanently employed respondents regularly work beyond contracted hours, and that although TOIL is the most common form of recompense, many noted that there is often insufficient time to take it in full. Seasonal contract structures, job security, a lack of flexibility around remote working, and delays in public sector recruitment, were also mentioned as barriers to employment and consequently, to capacity building.

**Research Participant:**

"We all need to be paid like the engineers because environmental discipline functions are just as critical to projects!"

**Project-based challenges:** It was noted that professional consultancy focusses heavily on development and legislative compliance rather than achieving restoration work on the ground, and this can sometimes cause people to seek alternative roles. Participants also explained that rather than being integrated early to inform the feasibility and design of a project, ecology can be viewed as simply a compliance exercise and is often brought in at the later stages. The seasonal constraints on survey work are not always recognised by the wider project team or correctly factored into programme milestones. This contributes to a reactive rather than proactive workflow. Survey work can become concentrated into short periods of time, and staff face considerable pressure to deliver urgent reporting and sign-off. Despite the demand for ecology services rising sharply across multiple sectors some participants felt there is still a lack of understanding and sometimes even a lack of respect for ecology within project teams and its role in supporting project delivery. Similar themes were reported by CIEEM, where respondents described ecology as being treated as "red tape" or a barrier rather than an essential service, and highlighted a broader sense of being undervalued by clients, other professions, government, and society[22].

**Research Participant:**

"There is an overall lack of understanding and respect for biodiversity as a critical part of overall processes and a failure to give it the high priority it needs and deserves"

**Cross-sector supports:** It was highlighted that Ireland has strong plans and programmes, however gaps in coordination, resourcing, policy, and implementation can create silos, inefficiencies, and ultimately hinder progress. One such example from participants was the low number of ecology roles in public bodies, such as local authorities. This results in a lack of understanding and support for ecological factors when projects progress through planning or compliance as suitably skilled personnel are typically not reviewing reports. Also referenced was a lack of clarity around the organisations and responsibilities within the wider ecology sector at a national level. These challenges can isolate the profession within wider systems or processes and can also make it difficult for new entrants and practitioners to navigate roles, legislation, and decision-making structures. Sector capacity becomes strained by these inefficiencies rather than supported through a *'whole of government, whole of society'* understanding as targeted in the National Biodiversity Action Plan.

**Working Conditions - Solutions:** Participants suggested measures to make ecology a more attractive and sustainable profession, while also improving how ecological input is recognised, coordinated, and resourced across the wider system. These proposals target both immediate workforce pressures and the wider structural constraints which affect long-term sector capacity.

**Professional Participant:**

"There is a need for centralised functions to avoid duplication and decrease siloing. This should improve coordination, improve communications, and make information more easily available".

**Participant Suggestions**

Improve pay, job security, and working conditions across the sector.

Support early-career ecologists, through paid placements, internships, and apprenticeships.

Recognise ecology as a core input on projects and integrate it at the early stages.

Enhance government leadership, resourcing, and public roles to support the ecology sector.

Invest in training, upskilling, and capacity-building to meet wider biodiversity objectives.

Improve coordination, centralisation, and data-sharing across the sector and wider processes.

Strengthen the presence of professional bodies in Ireland, to support practitioners.

# PART 3 - RECOMMENDATIONS

The above findings illustrate that the barriers to capacity building cannot be resolved by a single intervention or stakeholder. The recommendations below therefore focus on coordinated actions across education providers, employers, professional bodies, and public institutions, with measures designed to support both new entrants and those already working in the sector. They are grouped under three objectives to provide a clear framework for implementation and prioritisation. Actions relevant to the ecology sector and its stakeholders have also been identified in the SOLAS Green *Skills 2030* Report and Implementation Plan. It will therefore be important for the ecology sector and its stakeholders to engage with SOLAS and its partners to align efforts, avoid duplication, and support timely and effective implementation.

This research highlights a number of proposed recommendations which will require more detailed consideration. While their strategic direction is clear, each will need further development, including additional research, scoping, and action planning, before implementation can be progressed.

## Objective 1: Promote and facilitate entry into the sector

This objective focuses on widening and strengthening entry routes into professional ecology, including improved visibility of ecology careers at second level and third level, and the development of credible alternative entry routes for career changers and those from adjacent disciplines.

| Recommendation 1 | Potential Stakeholders | Timeline |
|---|---|---|
| Increase awareness of ecology as a profession and improve signposting of career pathways from second level through to early career. | CIEEM; DFHERIS / DoE (second level), EGFSN; HEA / HEIs (third level) SOLAS; NSC; Industry; Guidance counsellors | Medium term (2–5 years) |
| Suggested Considerations and Actions<br>☐ Develop a clear 'careers in professional ecology' information package for second level guidance counsellors, including role types and pathways (consultancy, local authorities, NGOs, semi-state).<br>☐ Strengthen signposting at university level (within environmental degrees) so ecology routes are visible alongside academic and lab-based pathways.<br>☐ Publish an Irish-specific career map showing common entry roles, progression routes, and competency requirements linked to the CIEEM competency framework. | | |

| Recommendation 2 | Potential Stakeholders | Timeline |
|---|---|---|
| Develop and promote alternative entry routes into ecology for career changers and those from adjacent disciplines. | SOLAS / QQI; ETBs; HEIs; CIEEM; Skillnet; Industry | Short–medium term (1–5 years) |

Suggested Considerations and Actions

- ☐ Define a small number of "recognised entry pathways" for lateral entrants (e.g., forestry, agriculture, horticulture, landscape architecture) and map competence gaps and upskilling pathways against the CIEEM competency framework.
- ☐ Develop QQI-aligned certificate/diploma options that can be delivered part-time / evenings and can stack towards higher-level qualifications, and with micro-credentials where needed. These should be linked to suggested target roles and competency profiles.
- ☐ Create guidance and clarity on how employers can recruit and onboard lateral entrants to integrate them into the sector - supervision expectations, tasks, staged responsibility.

| Recommendation 3 | Potential Stakeholders | Timeline |
|---|---|---|
| Expand apprenticeship-style and work-based learning pathways as a credible route into professional ecology | SOLAS; Industry; CIEEM; HEIs; ETBs; NSC | Medium term (2–5 years) |

Suggested Considerations and Actions

- ☐ Develop an apprenticeship / work-based degree route for ecology roles where appropriate, designed around competence development and supervised practice.
- ☐ Define minimum standards for supervised field practice and mentoring within work-based routes to ensure quality and consistency.
- ☐ Support and link the qualification to the CIEEM competency framework and accreditation.

| Recommendation 4 | Potential Stakeholders | Timeline |
|---|---|---|
| Improve public-facing information on roles and training routes (including short courses), to make entry pathways clear for new entrant and career-changers | CIEEM; SOLAS; HEIs; Course providers; Industry | Short term (1–2 years) |

Suggested Considerations and Actions

- ☐ Update Irish-facing job/role profiles on Green Jobs for Nature to include the range of training routes (degrees, conversion routes, short courses), and link job roles to competency profiles.
- ☐ Provide a simple "how to enter the sector" signposting resource for students and career changers.

## Objective 2: Improve graduate skills, workforce retention, and upskilling within the sector

This objective addresses skills shortages from within existing education and workforce pathways. It responds to findings that graduates often lack applied competencies required for entry-level roles, while early and mid-career staff need clearer development structures and better support to progress.

| Recommendation 5 | Potential Stakeholders | Timeline |
|---|---|---|
| Support the effective application of the updated CIEEM competency framework by providing clearer guidance on competence levels, role requirements, and pathways for skills development, with Ireland-specific context to be developed through supplementary guidance and incorporated at the next review. | CIEEM; Industry; HEI; SOLAS; Course providers | Short term<br>(1–2 years) |
| Suggested Considerations and Actions<br>☐ Develop Ireland-specific supplementary guidance (roles, regulatory context, career pathways)<br>☐ Align with HEIs, industry, and SOLAS training provision<br>☐ Feed Irish context into next framework update<br>☐ Map competencies to common ecology roles in Ireland<br>☐ Check alignment with Self-Assessment Tool | | |

| Recommendation 6 | Potential Stakeholders | Timeline |
|---|---|---|
| Develop standard tests of competence for the CIEEM competency themes, prioritising the technical competencies, to improve training, recruitment, and to support alternative pathways to the sector. | CIEEM; Industry; HEI; SOLAS; Course providers | Short term<br>(1–2 years) |
| Suggested Considerations and Actions<br>☐ Agree the most critical competencies to be tested and develop standard test methods with education and industry partners. (Similar Examples: BSBI FISC[23]; SOLAS CSCS[24]; UK NMC ToC[25])<br>☐ Align competency tests with common sector roles and professional levels – e.g., graduate, assistant, project, senior ecologist.<br>☐ Create an assessment process for practitioners to complete a quantitative evaluation of their base knowledge and to map a pathway to upskill to a particular role or competency. | | |

| Recommendation 7 | Potential Stakeholders | Timeline |
|---|---|---|
| Review the learning outcomes of existing university courses and implement adjustments or develop alternative courses which align with workforce skill needs and build capacity. | HEI; HEA; QQI; IUA; ETBs; CIEEM; Industry; SOLAS; EGFSN; NSC. | Medium term<br><br>(2-5 years) |

Suggested Considerations and Actions

- ☐ Audit and amend existing curricula and learning outcomes to ensure they are providing graduates with the necessary skills to enter the workforce at a junior level.
- ☐ Encourage CIEEM Accreditation as a way of feedback and improvement/QC for existing courses.
- ☐ Introduce more practical learning into university level. This should include field studies, GIS, surveying, and applied ecology.
- ☐ Create industry-led modules on applied ecology which specifically target standard procedures like AA Screening, EcIA, and EIA, whereby students complete sample projects, and are evaluated through a forum or discussion-style exam.
- ☐ Integrate mandatory work placements (3-6 months) into third-level degrees. Support industry partners to provide placements to ensure work experience is relevant, meaningful, and mentorship is gained.
- ☐ Develop new programmes, perhaps at masters level, specifically designed to train students to work in ecological consultancy. These could be facilitated and taught by an industry sponsored position in academia.

| Recommendation 8 | Potential Stakeholders | Timeline |
|---|---|---|
| Support graduates and early career ecologists to develop suitable skills and enter the workforce through structured programmes and funded training supports. | CIEEM; Industry; DFHERIS; SOLAS; Skillnet; NSC; Course providers; DHLGH | Short term<br>(1–2 years) |

Suggested Considerations and Actions

- ☐ Introduce structured paid graduate internship programmes (1–2 years) with measurable learning outcomes, across industry and public sector.
- ☐ Develop an Irish-specific early careers training programme to bridge academic learning and professional practice.
- ☐ Provide grants/sponsorship for training places for early-career ecologists to address affordability barriers, and to support organisations, particularly SMEs in offering opportunities.

| Recommendation 9 | Potential Stakeholders | Timeline |
|---|---|---|
| Establish clearer dual career pathways to support staff retention and progression (technical specialist route vs project/assessment route) and ensure career progression is not limited to moving into a management role. | Industry; CIEEM; HEIs | Medium term<br>(2–5 years) |

Suggested Considerations and Actions

- ☐ Define and publish senior progression routes that allow advancement through technical field/survey specialism or through project management/assessment/reporting.
- ☐ Link progression routes to competency profiles and CPD expectations to provide clear benchmarks for early/mid-career staff.
- ☐ Refer to dual-pathway concepts from other professions (e.g., medical specialisation pathways or solicitor / barrister routes) for frameworks which may be useful in the ecology sector. Use examples from the ecology sector where possible.

| Recommendation 10 | Potential Stakeholders | Timeline |
|---|---|---|
| Expand Irish-based CPD and practical field training availability (regionally accessible), including targeted training for senior/ principal staff | CIEEM; Skillnet; SOLAS; NGOs (e.g., training providers); Industry; HEIs | Short–medium term (1–5 years) |

Suggested Considerations and Actions

- ☐ Develop more Irish-based practical field courses and ensure regional accessibility; prioritise affordability for early career staff.
- ☐ Ensure CPD training is aligned with specific competence needs and clear learning outcomes, using the competency framework as a reference point.
- ☐ Develop targeted advanced modules for senior staff (e.g., environmental policy / impact assessment case-law), recognising that content and level should match role seniority.

| Recommendation 11 | Potential Stakeholders | Timeline |
|---|---|---|
| Develop micro-credentials as both “top-up” applied learning for graduates/early career staff and as stackable building blocks for lateral entrants | HEIs / QQI; Industry; CIEEM; SOLAS; Skillnet; Course providers | Short–medium term<br>(1–5 years) |

Suggested Considerations and Actions

- ☐ Design micro-credentials to serve two functions: targeted applied “top-up” training for ecology graduates missing practical knowledge, and stackable modules supporting lateral entrants or specific role pathways where a full degree may not be required.
- ☐ Link micro-credential learning outcomes to competency needs (and where feasible, to competency profiles / green job profiles).
- ☐ Address feasibility by developing funded delivery models (e.g., industry-supported posts or multi-year sponsorship arrangements) where universities lack capacity to deliver at scale.

## Objective 3: Enhance existing systems and processes to better support the ecology sector

This objective focuses on reducing avoidable inefficiencies and improving conditions around ecology delivery, including earlier integration of ecology in projects, better coordination and information sharing, planning and procurement improvements, and increased system capacity within public bodies.

| Recommendation 12 | Potential Stakeholders | Timeline |
|---|---|---|
| Improve planning system capacity for ecology by increasing in-house ecological expertise and earlier ecological integration at design stage | Local Authorities; DHLGH; OPR; CIEEM | Short–medium term<br>(1–5 years) |
| Suggested Considerations and Actions<br>☐ Develop consistent internal training for planners on ecological priorities, and early-stage risks / constraints to reduce later-stage issues and encourage proactive rather than reactive workflows.<br>☐ Increase the number of in-house planning ecologists in local authorities to ensure ecological issues are identified early (design stage) and that submitted reports are reviewed by suitably trained staff. | | |

| Recommendation 13 | Potential Stakeholders | Timeline |
|---|---|---|
| Improve public procurement processes and supports for ecology SMEs to broaden participation and reduce over-reliance in public projects on a small number of providers. | OGP / Government procurement; Industry; SME consultancies; CIEEM | Short term<br>(1–2 years) |
| Suggested Considerations and Actions<br>☐ Assess the capacity of ecology SMEs to understand the scale of work they can deliver and identify barriers to tendering and framework participation.<br>☐ Review procurement approaches and SME engagement mechanisms to improve SME participation in public contracts where appropriate. | | |

| Recommendation 14 | Potential Stakeholders | Timeline |
|---|---|---|
| Improve standardisation of applied methods and outputs to reduce inconsistency, inefficiency, and avoidable disputes, while aligning with professional guidance. | CIEEM; Industry; Public bodies; HEIs | Short–medium term (1–5 years) |
| Suggested Considerations and Actions<br>☐ Develop or coordinate Irish-specific standardised guidance and templates where inconsistency is creating inefficiencies. This should relate to existing CIEEM guidance and avoid duplication or conflict.<br>☐ Promote the use of shared templates and agreed approaches to improve comparability, training efficiency, and staff mobility across employers. This could also inform teaching methods in university and micro-credentials. | | |

| Recommendation 15 | Potential Stakeholders | Timeline |
|---|---|---|
| Improve communication, coordination and assignment of responsibilities to reduce siloing, duplication and improve cross-sector collaboration. | Government / DHLGH; CIEEM; Public bodies; Industry; SOLAS; NPWS; EPA | Medium term<br>(2–5 years) |

Suggested Considerations and Actions

- ☐ Improve signposting of roles, responsibilities, and guidance within the Irish ecology system to ensure stakeholders understand sector workflows and coordination.
- ☐ Create a sector-wide mechanism to improve communication and coordination. Sector functions should be either centralised or clearly segregated with responsibility and objectives clearly defined to reduce duplication and improve access to information.

| Recommendation 16 | Potential Stakeholders | Timeline |
|---|---|---|
| Develop shared repositories to access data and reporting to reduce repeated survey effort and increase efficiency and transparency | Public bodies / DHLGH; Industry; CIEEM; NBDC; NPWS | Short–medium term<br>(1–5 years) |

Suggested Considerations and Actions

- ☐ Explore practical models to share outcomes of surveys and reports (within legal and data constraints), to reduce duplication and support consistent approaches across related project typologies and location.
- ☐ Improve data sharing standards for public ecological data
- ☐ Support standardised reporting structures where possible to improve interoperability and reuse.

| Recommendation 17 | Potential Stakeholders | Timeline |
|---|---|---|
| Improve cross-sector ecological literacy for adjacent professions to support the early engagement of ecology on projects and its incorporation into project timelines. | Professional bodies / training providers; CIEEM; Industry; HEIs; SOLAS; Skillnet | Medium term<br>(2–5 years) |

Suggested Considerations and Actions

- ☐ Develop targeted training for planners, designers, and adjacent environmental roles on ecological considerations, and early-stage design principles, including the mitigation hierarchy and the importance of retaining existing high-nature value areas.
- ☐ Embed ecological constraints and seasonal survey realities earlier into project planning norms across disciplines.

| Recommendation 18 | Potential Stakeholders | Timeline |
|---|---|---|
| Build sector capability to anticipate policy and delivery demands (e.g., restoration) and align training planning accordingly | SOLAS / skills stakeholders; CIEEM; HEIs; Public bodies; Industry | Medium–long term<br>(2–10 years) |

Suggested Considerations and Actions

- ☐ Conduct periodic reviews of current and forthcoming policy drivers and translate this into a skills/training adaptation plan to inform curricula and CPD priorities.
- ☐ Develop frameworks and training responses aligned to emerging compliance and delivery requirements where relevant.

| Recommendation 19 | Potential Stakeholders | Timeline |
|---|---|---|
| Ensure existing and future funding for skill development nationally is invested in the ecology sector, to ensure long-term capacity building to deliver on national targets. | Government; DFHERIS; HEA; HEIs; CIEEM; Public bodies; Industry; SOLAS; Skillnet | Medium–long term<br>(2–10 years) |
| Suggested Considerations and Actions<br>☐ Provide adequate funding to ensure the workforce capacity can meet the current and upcoming demand for ecological expertise.<br>☐ Ensure individuals undertaking training are financially supported and that pathways into the sector are not affected by funding barriers. | | |

# Conclusion

This study shows that the ecology sector in Ireland is facing a considerable capacity challenge. Barriers arise at multiple career stages, including entry into the profession, the development of applied skills, retention of staff, career progression, and the wider systems around ecological project work. The recommendations set out above reflect the need for coordinated action across education, training, employment, professional practice, and public systems. While some measures can be progressed in the short term, others will require longer-term collaboration, investment, and institutional support if they are to deliver meaningful change.

At the same time, the profession itself remains highly valuable and has significant potential. Ecology is a rewarding field of work, and its role has expanded rapidly in recent years as biodiversity loss, nature restoration, infrastructure delivery, and renewable energy have taken on greater importance within policy, planning, and project delivery. With the right capacity-building measures in place, the sector will be better equipped not only to support responsible development, but also to lead in restoration, enhancement, and long-term stewardship of the natural environment. Strengthening capacity in professional ecology is therefore not only a workforce issue; it is an investment in the people, skills, and systems needed to protect, restore, and responsibly manage one of the country's most important long-term assets.

# Glossary

| Acronym | Description |
|---|---|
| AA | Appropriate Assessment |
| ADAPT | Research centre for AI-driven digital content bringing together academics, researchers and industry partners. |
| AI | Artificial intelligence |
| BNG | Biodiversity net gain |
| BSBI | Botanical Society of Britain and Ireland |
| CIEEM | Chartered Institute of Ecology and Environmental Management |
| CPD | Continuing professional development |
| CSO | Central Statistics Office |
| CSRD | Corporate Sustainability Reporting Directive |
| DFHERIS | Department of Further and Higher Education, Research, Innovation and Science |
| DHLGH | Department of Housing, Local Government and Heritage |
| ECoW | Ecological Clerk of Works |
| EGFSN | Expert Group on Future Skills Needs |
| EIA | Environmental Impact Assessment |
| EPA | Environmental Protection Agency |
| EU | European Union |
| EcIA | Ecological Impact Assessment |
| GIS | Geographic Information System |
| HEI | Higher Education Institution |
| ICT | Information and Communications Technology |
| IRE | Ireland |
| IT | Information Technology |
| LERO | Research Ireland Centre for Software bring together academia and software companies |
| MSc | Master of Science |
| NBAP | National Biodiversity Action Plan |
| NBDC | National Biodiversity Data Centre |
| NGO | Non-governmental organisation |
| NIBRT | National Institute for Bioprocessing Research and Training |
| NPSs | National Planning Statements |
| NPWS | National Parks and Wildlife Service |
| NSC | National Skills Council |
| NbS | Nature-based solutions |
| OECD | Organisation for Economic Co-operation and Development |
| OPW | Office of Public Works |
| PEA | Preliminary Ecological Appraisal |
| PhD | Doctor of Philosophy |
| QQI | Quality and Qualifications Ireland |
| SBTN | Science Based Targets Network |
| SEA | Strategic Environmental Assessment |
| SME | Small and medium-sized enterprise |
| SOLAS | Further Education and Training Authority |
| TNFD | Taskforce on Nature-related Financial Disclosures |
| TOIL | Time Off In Lieu |

# References


1. SOLAS; (2025); *National Skills Bulletin* 2025
2. UNEP; (2026); *'Green Economy'*. Accessed January 2025.
3. SOLAS; (2025); *Spring Skills Bulletin* 2025
4. Kaura, A.; (2024); LinkedIn: *Understanding the Green Transition, Supply and Demand Dynamics*.
5. CIEEM; (2022); Briefing document on the current capacity crisis and the need to provide supports to the professional ecology sector.
6. OECD (2023); *Skills Strategy Ireland: Assessment and Recommendations*
7. NSC; (2025); *National Skills Council Strategic Advice 2025*
8. SOLAS; (2024)*; Green Skills 2030*
9. EGFSN; (2025); Skills Insights Note 2025-1. *Cross Sectoral Synergies and Transversal Skills*
10. DPEIPSRD; (2025)*; National Development Review Plan 2025*
11. DHLGH; (2025); *National Planning Framework: First Revision.* April 2025
12. DHLGH; (2025); Number 34 of 2024 – *Planning and Development Act* 2024
13. NPWS; (2025); *The Status of EU Protected Habitats and Species in Ireland,* 2025: Summary Report
14. EU; (2024); Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869
15. DHLGH; (2023); Ireland's 4th National Biodiversity Action Plan 2023-2030
16. DHLGH; (2023); Number 25 of 2023 – *Wildlife (Amendment)* Act 2023
17. European Parliament, & Council of the European Union. (2022). *Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting.* Official Journal of the European Union.
18. Science Based Targets Network. (2024). *Science-based targets for nature: An overview for companies.*
19. Taskforce on Nature-related Financial Disclosures. (2023). R*ecommendations of the Taskforce on Nature-related Financial Disclosures* (Version 1.0).
20. Mammal Society. (2025, May 12). *Cross-sector concerns about decline of fieldwork opportunities in UK life science courses*. Mammal Society.
21. Soga, M., & Gaston, K. J. (2025). Extinction of experience among ecologists. *Trends in Ecology & Evolution.*
22. CIEEM (2025); *State of the profession survey.* Chartered Institute of Ecology and Environmental Management.
23. Botanical Society of Britain and Ireland: Field Identification Skills Certificate: https://bsbi.org/learn/training/field-identification-skills-certificate
24. SOLAS Construction Skills Certification Scheme: https://www.solas.ie/construction-lp/cscs/
25. UK Nursing and Midwifery Council, Test of Competence. https://www.nmc.org.uk/registration/joining-the-register/toc/

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



CIEEM