

Ashnihilation

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Abstract

Ashnihilation is a practice-led research project by Dr Tom Milnes that explores how immersive technologies—specifically augmented reality (AR)—can foster emotional and critical engagement with ecological crisis. Commissioned as part of Plymouth's Green Minds initiative and funded by the European Regional Development Fund/Urban Innovation Actions, the project integrates posthumanist theory, speculative design, and community co-creation to reframe human-nature relationships through site-specific, digitally augmented storytelling.

Audiences encountered animated, 3D-scanned hybrid species affected by Ash dieback, accessed via Microsoft HoloLens headsets and mobile AR filters. These creatures were collaboratively developed with Arts University Plymouth students and alumni across Animation, Games, and Costume Production, incorporating sound design, spatial audio, and costume aesthetics.

Disseminated through seven twilight events on Plymouth Hoe, a risograph-printed zine with QR codes, a city-centre window display, and online AR platforms, the work reached over 22,000 users. The project is recognised as a model for combining speculative narrative with ecological storytelling, contributing to ongoing discourse in XR, digital storytelling, and multispecies ethics.

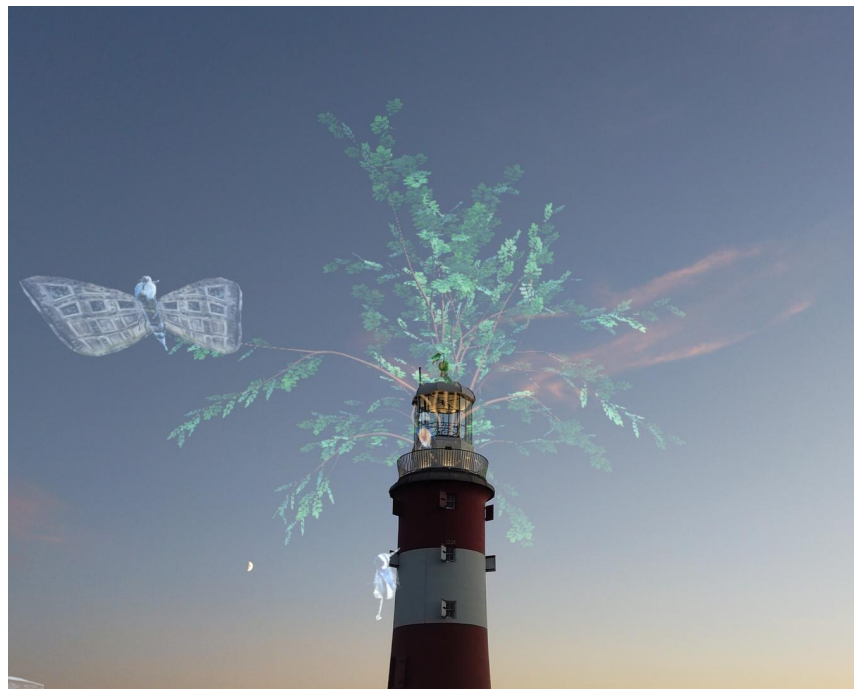
Project Overview

Ashnihilation was developed in response to the ecological threat of Ash dieback and broader biodiversity loss in South West England. Commissioned as part of Plymouth's Green Minds initiative—funded by the European Regional Development Fund and Urban Innovation Actions—the work explores how immersive technologies and speculative design can foster emotional and critical engagement with ecological crisis.

Drawing on posthumanist and affect theory, the project critiques anthropocentric modes of environmental communication by reimagining human-nature relationships. It introduces the concept of “augmented ecologies”: immersive environments that situate participants within multispecies networks and ecological precarity.

Hybrid creatures—digitally animated from photogrammetry scans of Plymouth landmarks and local species—were co-designed with students and alumni across Animation, Games, and Costume Production at Arts University Plymouth. The work blended spatial audio, glitch aesthetics, and speculative narrative to evoke a sense of ecological haunting.

Ashnihilation was disseminated through seven twilight AR events on Plymouth Hoe, reaching 174 in-person participants, and via mobile AR filters embedded in risograph-printed zines and city-centre QR code installations, extending access to over 22,000 digital users. This approach positioned immersive storytelling as a tool for inclusive, participatory engagement with environmental grief, rewilding imaginaries, and multispecies futures.



Ashnihilation screen capture (Sept 2022) / Dr Tom Milnes

Context and Research Questions

At the heart of *Ashnihilation* lies a critical exploration of how immersive technologies—particularly augmented reality (AR) and spatial audio—can challenge anthropocentric perspectives and foster emotional engagement with ecological crisis. Informed by posthumanist theory (e.g. Braidotti), speculative design (e.g. Dunne & Raby), and affect theory (e.g. Massumi), the research examines how digital storytelling can reposition human experience within entangled multispecies ecologies.

The project builds on Dr Tom Milnes' prior practice in photogrammetry and immersive environments, extending these methods into collaborative, site-specific installations shaped by local ecological narratives. Through interdisciplinary co-creation with students, artists, and ecologists, *Ashnihilation* offers a model for using XR technologies in rewilding the imagination and civic environmental discourse.

The central research questions are:

- How can immersive, interactive experiences provoke emotional and critical engagement with ecological loss?
- In what ways can digital storytelling foreground non-human perspectives and decentre the human subject?
- How can speculative narrative structures and sensory interaction evoke complex affective responses to environmental degradation?
- What does the process of co-developing augmented ecologies reveal about the role of imagination in fostering ecological agency and public understanding?
- How can interdisciplinary collaboration across art, technology, and ecological science generate accessible, inclusive modes of environmental communication?

The research builds on Dr Milnes' previous explorations in photogrammetry and digital collage, while also providing a case study in how universities can act as catalysts for nature-based innovation.

Keywords

Augmented reality, posthumanism, ecological storytelling, creative technology, immersive media, ash dieback, spatial audio, community engagement, digital storytelling, site-specific performance



Ashnihilation performance event (Sept 2022) / photo credit: Sarah Packer



Ashnihilation screen capture (Sept 2022) / Dr Tom Milnes

Research Method

Research Methodology

Ashnihilation employed a practice-led, iterative methodology that combined speculative design, immersive technology, and ecologically situated storytelling. Grounded in posthumanist theory and creative technology, the research explored how immersive media—particularly AR and spatial audio—can communicate urgent ecological issues such as ash dieback to a wide public. The work evolved in direct response to Plymouth's Green Minds "Nature Scaper" commission brief, which prioritised community co-creation, sustainability, and technological innovation.

The research began with extensive environmental and audience consultation with Devon Wildlife Trust and Green Minds. These early engagements shaped the thematic focus on ash dieback and multispecies dependency, shifting the project from a conceptual nature 'portal' to a site-specific experience rooted in local biodiversity. Field research included ecology, species interaction, and the systemic consequences of species loss.

Technical Development

Photogrammetry and 3D scanning of Plymouth landmarks provided the raw material for the animated hybrid species. These were processed in Unreal Engine and deployed through Microsoft HoloLens and mobile AR filters. Spatial audio, developed using local field recordings, created immersive soundscapes performed binaurally via the HoloLens 360 speakers. Collaboration was essential: AUP alumni and students (Games, Animation, Costume Production), Fab Lab Plymouth (3D scanning/laser cutting), and creative technologists like Sam Grotzke enabled co-creation across disciplines.

Responsive Making and Testing

Studio and on-site prototyping informed performance design, including key insights like the necessity of twilight scheduling due to the HoloLens' light and sensor limitations. A second version (V2) adapted the experience for the Green Minds conference with a scaled 3D scan of Smeaton's Tower and an interactive menu system. To expand accessibility, mobile-compatible AR filters were developed and disseminated via QR-embedded risograph pamphlets.

Costumed performance (by BA Costume Production students) and structured audience flow—staggered HoloLens use, preambles, and pamphlet distribution—ensured inclusive, meaningful engagement. Public feedback and volunteer insights shaped iterative refinements across multiple engagement contexts.

Ethical and Participatory Design

The project was designed with environmental ethics and accessibility in mind. Printed materials used sustainable risograph processes. QR codes extended reach, and participatory delivery with community volunteers helped embed the work into wider networks of civic engagement.



Ashnihilation performance event (Sept 2022) / photo credits: Sarah Packer

Key Insights

- **Technical innovation:** Demonstrated novel use of AR technology in outdoor, site-specific contexts within the South West. Pioneered the integration of 3D-scanned collage into interactive mixed reality artworks.
Affective and speculative storytelling: Immersive and ambiguous narrative structures fostered “ecological haunting”—participants reported a lingering emotional response that extended reflection beyond the event.
- **Multispecies and posthumanist framing:** Engaged participants in new ethical imaginaries of human-nature relationships, supported by speculative species and entangled ecologies.
- **Social engagement:** Created unique forms of ecological storytelling through co-designed visual, audio, and performance-led interaction. Provided a model for engaging non-arts audiences with environmental research.
- **Dissemination as research:** The mobile filters and risograph zine weren’t just communication tools—they were integral to the methodology, enabling hybrid interaction and longer-term impact.
Curriculum legacy: Methodologies from Ashnihilation have informed the design of AUP’s BA (Hons) Creative Technologies, embedding ecological storytelling and immersive media into institutional teaching.

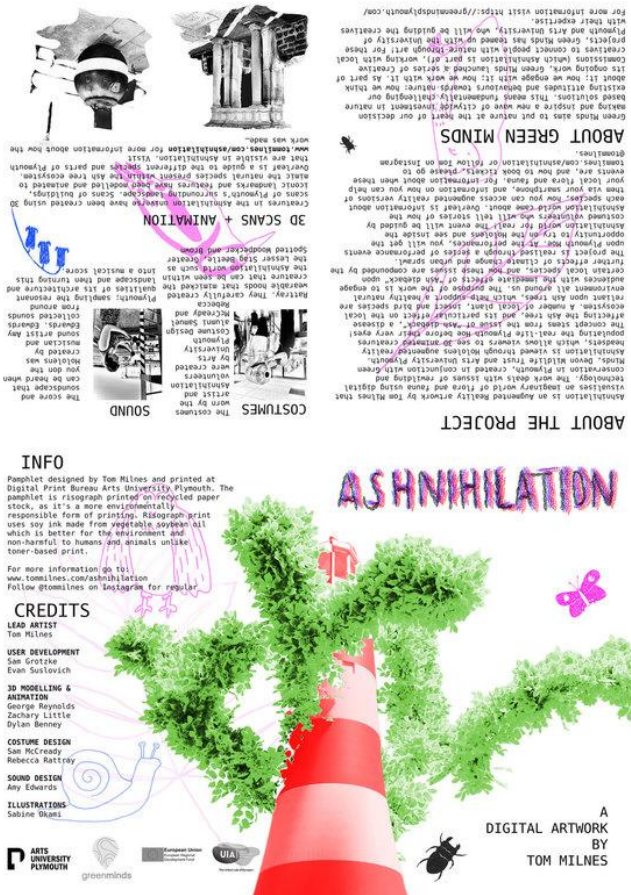
Together, these methods and insights present a transferable model for interdisciplinary, place-responsive creative research at the intersection of XR, ecology, and civic participation.

Key methodological components:

1. **Iterative prototyping** using HoloLens, Unreal Engine, and photogrammetry
2. **Cross-disciplinary collaboration** with students, alumni, and technical specialists
3. **Participatory co-design** shaped by public testing and community input
4. **Situated environmental research** in partnership with Green Minds and Devon Wildlife Trust
5. **Responsive making** guided by real-world constraints and sustainability priorities



Ashnihilation performance event (Sept 2022) / photo credits: Sarah Packer



Research Insights

Key Findings and Research Insights

Ashnihilation generated new insights into how immersive, site-responsive storytelling can prompt ecological reflection, ethical awareness, and public engagement through digital practice. The following findings emerged through iterative prototyping, collaborative performance, and audience feedback:

1. Immersive Ambiguity as Ecological Provocation

One of the project's central discoveries was the power of narrative ambiguity in immersive XR. By avoiding didactic or goal-oriented structures, the experience fostered reflection rather than instruction. This approach encouraged audiences to consider the emotional and ethical dimensions of ecological collapse, particularly the little-known impacts of ash dieback. Several participants described the emotional resonance as lingering beyond the event itself—a phenomenon framed as “ecological haunting.”

2. Embodiment, Disorientation and Ecological Sensory Space

The project demonstrated that embodied interaction, facilitated by HoloLens technology and spatial audio, can simulate the instability of disrupted ecosystems. This sensory disorientation mirrored ecological precarity and contributed to a distinct affective impact. One volunteer described the experience as:

“Brilliant... massive possibilities for the future of gaming. Very exciting.”

This affective strategy extended to the performance design, with community-made costumes and twilight scheduling heightening atmosphere and symbolism.

3. Dissemination as Method

Printed risograph zines and mobile-compatible AR filters emerged not merely as outreach tools but as integral components of the research. These dissemination forms allowed the work to exist in multiple temporalities—live, mobile, and ongoing—providing a model for sustainable and inclusive XR practice. Rachel Dobbs of The Village Hub noted:

“It was the first time any of us had experienced an artwork made for HoloLens... It felt cinematic and special. Creative projects like Ashnihilation allow us to have new conversations and think about things that really matter in new ways.”

4. Interdisciplinarity and Community Co-Creation

The project's co-design approach—engaging sound artists, costume-makers, coders, illustrators, volunteers, and ecology partners—was essential to both methodology and impact. Collaborative making produced hybrid creatures and multisensory environments that were both imaginative and research-informed. This mode of working not only expanded the technical and aesthetic scope of the project, but ensured ethical and localised relevance.

5. Knowledge Exchange and Pedagogic Legacy

Ashnihilation directly informed AUP's curriculum design in Creative Technologies and remains embedded across interdisciplinary teaching in Games, Animation, and Costume. It also offered transferable insights for wider XR practice: specifically, how speculative, affective storytelling can enhance ecological literacy and prompt civic imagination.

Summary

Ashnihilation contributes to emerging conversations in augmented ecologies, XR ethics, and speculative climate storytelling. It offers a model for how immersive media can operate not only as experience but as research, pedagogy, and public dialogue.

Impact/Dissemination

Dissemination Activity

Ashnihilation was experienced through seven twilight AR performance events on Plymouth Hoe between August and October 2022. These events drew 174 attendees from across the city, including members of ten community groups such as The Village Hub, Natural Grid Apprentices, About Face, Green Thinkers, Snapdragons, Pollenize, and Stiltskin Theatre. The events were co-delivered with the support of 18 trained volunteers, recruited in part through The Box.

A public window-display installation ran throughout January 2023 at Cornwall Street Project Space. This extended access via QR codes linking to mobile AR filters hosted on Meta Spark, enabling interaction with the artwork outside formal performance contexts. These mobile filters were accessed over 22,000 times and captured over 1,300 times on Instagram.

Public-Facing Materials and Access

To maximise accessibility and sustainability, a risograph-printed pamphlet featuring ecological information and QR access points was distributed at events and exhibitions. These materials enabled continued engagement after the events, and reached audiences with limited mobility or digital access. A QR plaque for permanent display at Smeaton's Tower has been proposed to further embed the work in the local cultural landscape.

One attendee, Rachel Dobbs from The Village Hub, remarked:

“I loved being greeted by the costumed assistants at sunset. It felt really cinematic and special... It was the first time that any of us in the group had experienced an artwork made for Hololens, and was a really memorable and unique experience.”

Volunteers also praised the experience:

“The augmented reality glasses permitted engagement in an interesting project through innovative technological means. I particularly remember the children's 'oohs' and 'aahs', indicative of wonderment!”

“It was brilliant... For me it opened up massive possibilities for the future of gaming. Very exciting.”

Exhibitions and Presentations

Ashnihilation was featured at:

- The Green Minds Conference (Market Hall, June 2023), including a V2 version tailored to the venue with an interactive menu and 3D scan of Smeaton's Tower. 168 attendees at the conference including local and national policy makers, academics, and environmental organisations, alongside project partners and funders.
- Natural England's celebration to open the coastal path (Royal William Yard, Sept 2023)
- Fulldome UK Festival (Nov 2022), in a panel on climate crisis and immersive storytelling.
- Creative Practice³ at the Design Museum (Nov 2022), where the project was presented within the UX/UI and speculative design strand.
- Arts University Plymouth's internal Research Symposium.

Institutional and Educational Impact

The methodologies and collaborative frameworks developed during Ashnihilation directly informed the structure of the BA (Hons) Creative Technologies degree at Arts University Plymouth, launching in 2023. The project was also embedded as a teaching case study across Animation, Games, and Costume courses, influencing curriculum content and pedagogical design.

Community and Sectoral Reach

Ashnihilation brought together a wide network of collaborators including Devon Wildlife Trust, Real Ideas, The Data Place, National Trust, and local creative practitioners. It modelled best practice in cross-sector environmental communication and arts-based public engagement.

Feedback consistently highlighted the project's emotional resonance and educational value: "Seeing the animated creatures move around in front of us got us thinking about the bugs and birds... and how these are threatened by the climate emergency, disease and species extinction." — Rachel Dobbs, The Village Hub

Media and Legacy

Ashnihilation was profiled across AUP and Green Minds platforms and featured in institutional press articles. Materials including the zine and mobile AR filters continue to circulate among community partners. The work's hybrid dissemination strategy has ensured its legacy extends beyond the original events, both digitally and materially, as a durable model for place-based, ecologically driven XR storytelling.

Summary

Ashnihilation represents a major practice-led research output that contributes original methods to the creative industries by fusing augmented reality with public environmental storytelling. It exemplifies best practice in arts-based civic engagement through collaboration with Green Minds, community groups, and Arts University Plymouth students.

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