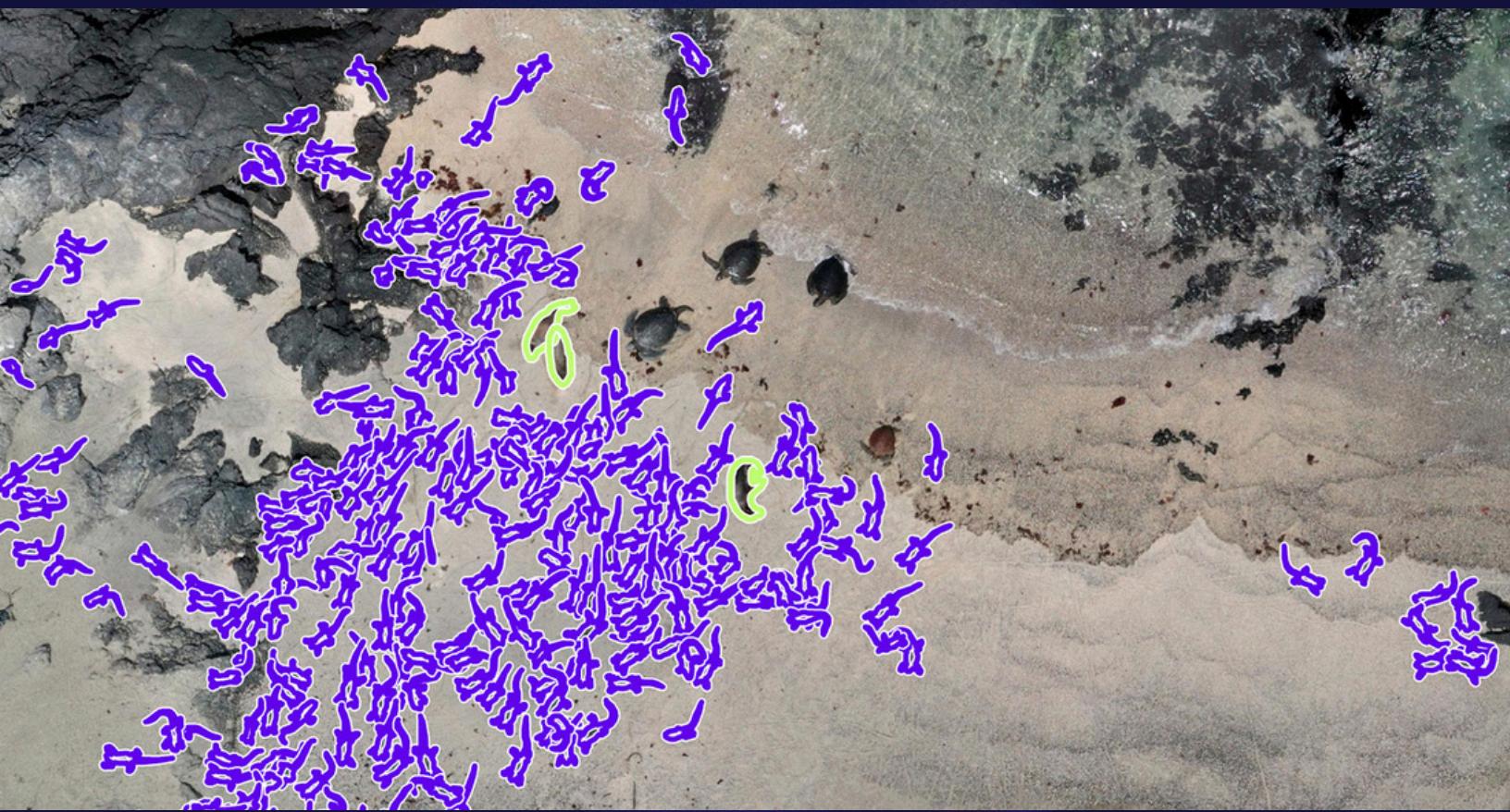


# THE STATE OF CONSERVATION TECHNOLOGY: 2023

Explore insights from the first multi-year, global assessment capturing community insights on the evolution of technology for nature.



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# Executive Summary

Drawing on three years of global survey data, this summary highlights where the conservation technology sector stands and where it must go next. It distills the most critical insights from the report, surfacing persistent constraints, shared priorities, and clear opportunities for action to guide more effective investment, partnership, and implementation strategies.

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## Purpose and Context

The State of Conservation Technology 2023 is the latest in WILDLABS' ongoing longitudinal research program tracking global trends, challenges, and opportunities in the conservation technology sector. Based on survey data from 671 respondents collected between 2020 and 2022, this report provides a three-year trends analysis—the first of its kind in the field. The findings are intended to inform policy, funding, and programmatic decisions that will shape the future of conservation innovation.

## Core Findings

While technology use remains widespread across the sector, key constraints persist, especially in funding, coordination, and aligning technical solutions with on-the-ground needs. End-users in developing economies reported significantly higher barriers, including limited access to local suppliers, training, and ongoing support. Female respondents also reported disproportionate challenges, particularly in developer roles. These systemic gaps limit equitable participation and slow the pace of progress.

## Opportunities for Action

Despite these constraints, the global community is aligned on how to move forward. Respondents consistently identified the need to improve collaboration and information sharing, make tools more accessible and user-friendly, and strengthen interoperability. Additional priorities include investing in local capacity, expanding support for data analysis at scale, and improving global infrastructure for data sharing. Progress will require strategic investment, stronger cross-sector collaboration, and a sustained commitment to equity and usability in tool development and deployment.

## WILDLABS' Role

As the world's leading conservation technology network, WILDLABS is working to address many of these needs directly, connecting over 12,000 members across 135+ countries through community-building, research, and strategic resourcing. This report helps guide our programs while also supporting the broader sector in identifying shared priorities and tracking progress toward more inclusive, effective, and scalable conservation technology solutions.

# About the Research

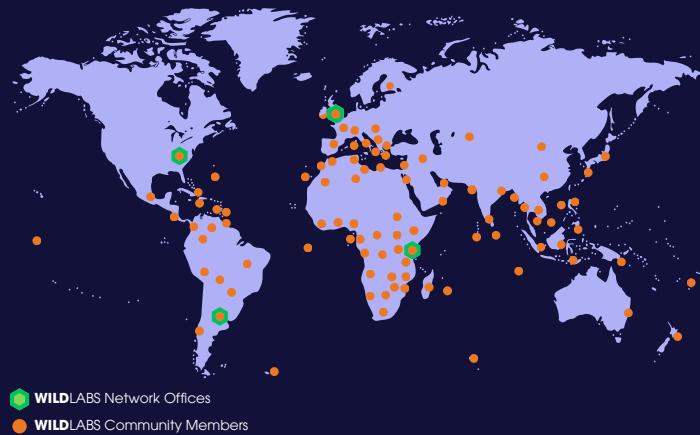
In the face of accelerating global environmental crises, harnessing the full potential of modern technology for conservation is no longer optional—it's essential. As the global community works toward achieving ambitious biodiversity goals by 2030, there is an urgent need to strengthen technical capacity, align investments, and accelerate innovation. Through this research, WILDLABS aims to build the evidence base needed to support practitioners, inform strategic funding decisions, and shape policies that unlock the transformative potential of technology for biodiversity outcomes.

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The State of Conservation Technology 2023 builds on our 2021 baseline with the first-ever three-year trends analysis of the conservation technology sector. This longitudinal view reveals how priorities, challenges, and opportunities are evolving across the global community. By tracking both shifting dynamics and persistent barriers, this report surfaces actionable insights to drive more effective, inclusive, and scalable solutions. Our goal is to ensure the voices of those working on the ground are heard and reflected in the strategies that shape the future of conservation innovation.

## What is WILDLABS?

WILDLABS is the world's leading conservation technology network, connecting more than 12,000 conservationists, researchers, engineers, and technologists across 135+ countries. Through our global online platform, we drive collaboration, share expertise, and accelerate innovation to meet conservation's most pressing challenges.



Our growing research program taps into the insights of this diverse community to identify gaps, inform capacity-building, and support the development and scaling of impactful tools. From frontline practitioners to technical experts, WILDLABS empowers the people and solutions shaping the future of conservation technology.

Visit our [platform](#) and [YouTube channel](#) to learn more about the community, and follow us on [LinkedIn](#), [X](#), and [Bluesky](#) to stay in touch.

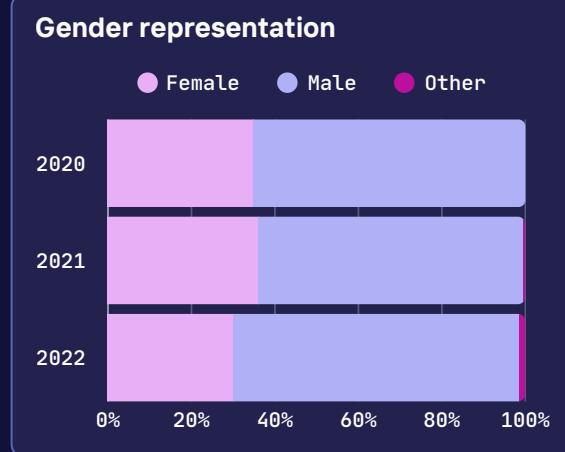
# Respondents

This report draws on three years of global survey data, reflecting the perspectives of 671 respondents across conservation, research, and technology sectors. Collected through WILDLABS and partner networks from 2020 to 2022, the data represent a broad cross-section of expertise, with about half identifying as WILDLABS members. While some demographic and regional groups remain underrepresented, participation has generally improved over time. Respondents' work focused primarily on ecological monitoring, species protection, and protected area management.

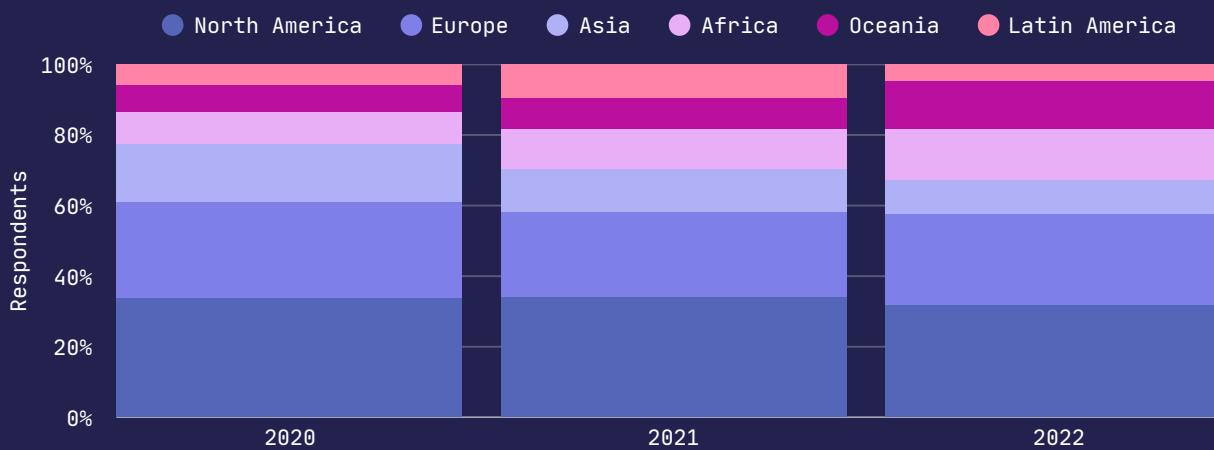
## Sociodemographics

Across the years, roughly one-third of respondents identified as female (34%), two-thirds identified as male (66%), and a few identified as 3rd gender or non-binary (<1%).

Geographically, the survey initially skewed toward respondents from North America and Europe. However, WILDLABS' ongoing efforts to expand regional engagement have contributed to improved representation from other areas over time. Notably, between 2020 and 2022, the proportion of respondents from Africa increased from 8.9% to 14.3%, while combined representation from North America and Europe decreased from 63% to 57%.

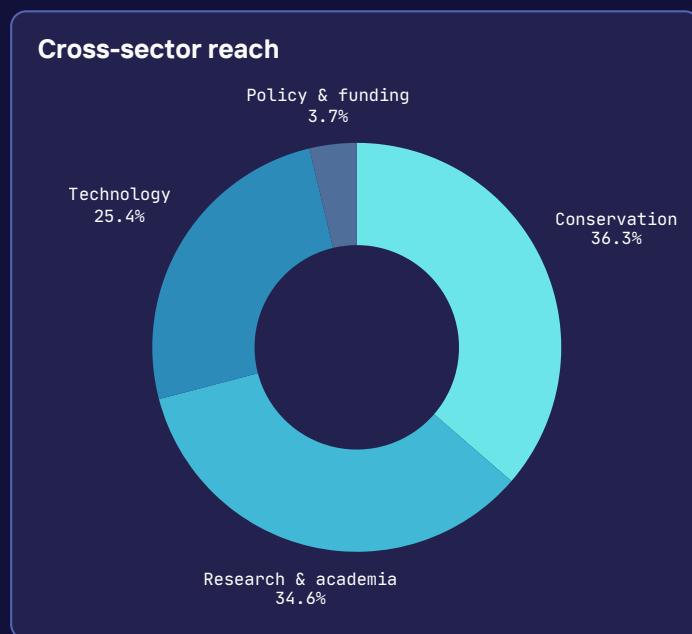


## Geographic reach

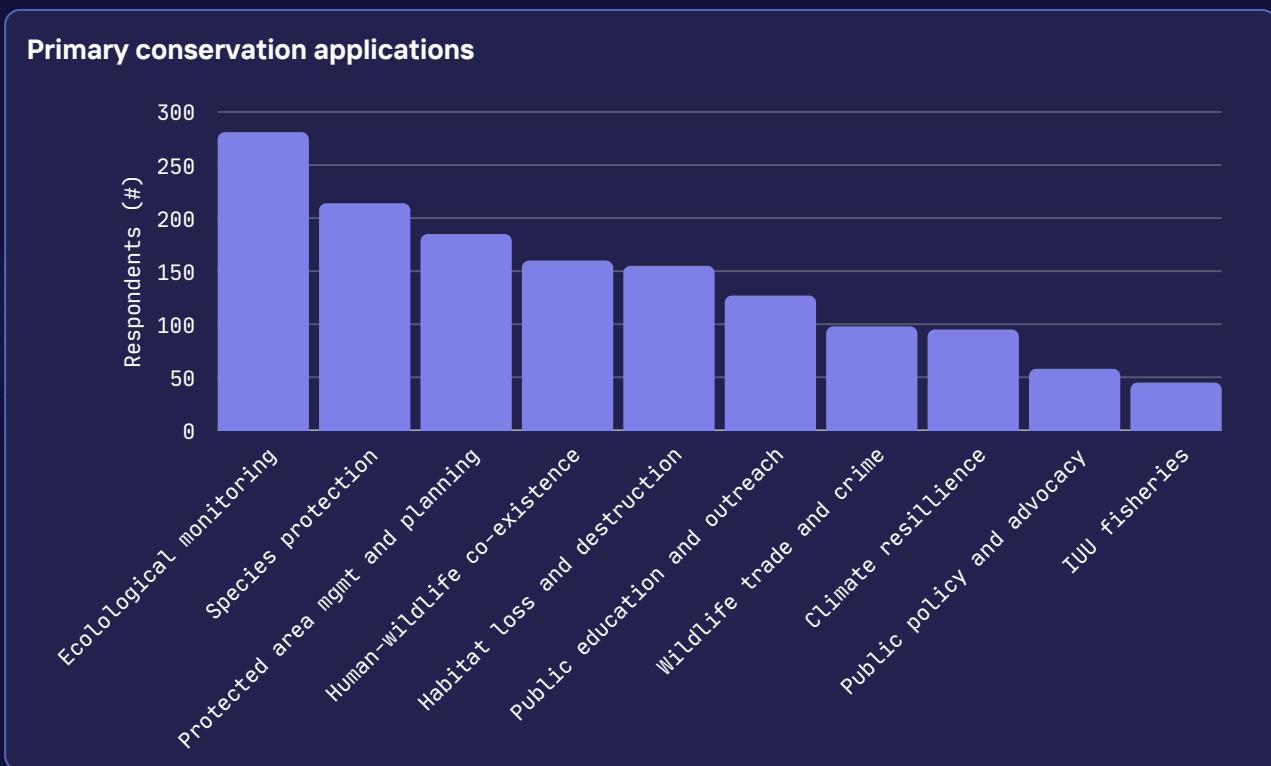


## Expertise

Survey participants represented a wide range of professional backgrounds. Across all three years, most respondents reported primarily working as conservationists, followed by researchers, and then technologists, with a smaller portion engaged in policy making and funding. This mix reflects the cross-sector nature of conservation technology and the increasing collaboration between conservation and technical communities. Respondents most commonly identified being employed by conservation non-profits, academic or research institutions, private tech companies, or government agencies, highlighting the diversity of skillsets and perspectives within the sector.



We also asked about the main conservation issues participants focus on in their work. The most common application area reported was ecological monitoring, followed by species protection, and then protected area management and planning. These priorities remained consistent across the two years in which this question was asked.



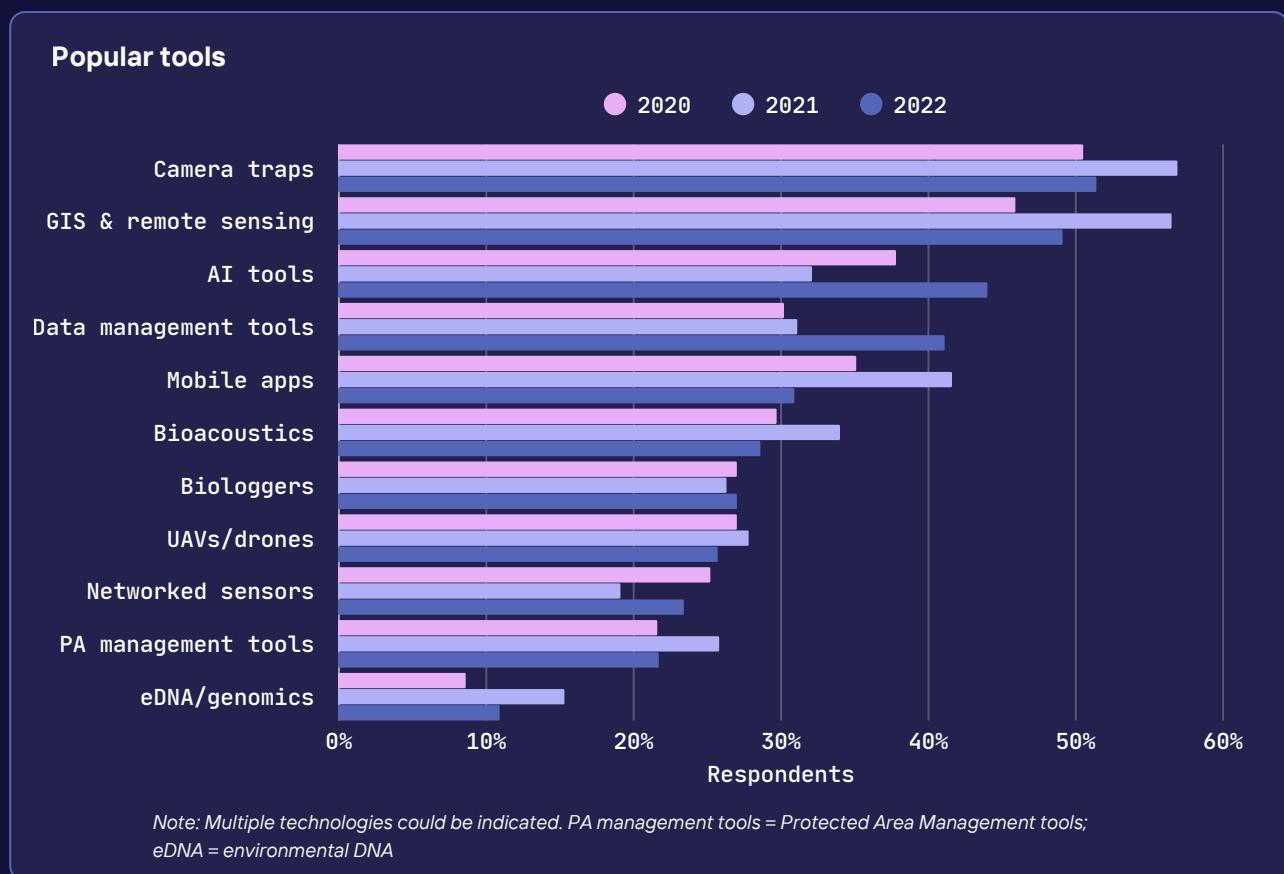
# Current Tools

This section explores the technologies conservation professionals are using most frequently, and how their perceptions of these tools' effectiveness and future promise have evolved over time. While the most commonly used tools—like camera traps, GIS, and AI—have remained consistent since 2020, views on their potential impact have shifted, reflecting changing expectations and real-world experience with emerging technologies.

## Usage and Proficiency

For all years investigated, most survey respondents indicated that they frequently engage with one or more of 11 core conservation technology groups. Notably, almost all respondents reported engaging with more than one technology type (92%), and the vast majority said they engage with more than two (79%). Camera traps, GIS and remote sensing, and AI tools

were the most widely used out of these groups. The average self-reported level of expertise was similar across technology groups (3-3.2 out of 5), with the exception of environmental DNA (eDNA) and genomics, which had the smallest sample size and lower average level of expertise (2.7-2.9 out of 5)—likely at least in part due to its relative novelty to the field.



## Performance vs Promise

To understand how tools are perceived beyond usage, we asked respondents to rate each technology group based on both current performance and perceived potential to advance conservation. In 2020, GIS and remote sensing, drones, and mobile apps were seen as the highest-performing tools, while AI tools, eDNA and genomics, and networked sensors were viewed as having the most potential to transform the field.

By 2022, these perceptions had shifted. GIS and remote sensing remained the highest-performing group, but drones and mobile apps were overtaken by protected area management tools and bioacoustics. Meanwhile, eDNA and genomics fell sharply in perceived potential, replaced at the top by biologists, networked sensors, and AI tools.

### Perceived high potential tools



*Note: The above two graphs show the ranking of the mean scores of survey responses for each technology. Respondents rated technologies on both fronts on scales from 1-5, with 1 being the least positive and 5 being the most.*

These shifts reflect broader patterns in how new technologies mature. As described in the Gartner Technology Hype Cycle, early excitement around emerging tools can lead to inflated expectations, followed by a drop as challenges surface before reaching a more stable phase of adoption, learning, and application. Understanding where tools fall in

this hype cycle can help guide realistic investment and support strategies. For policy and funding stakeholders, these insights can inform where targeted capacity-building, technical support, or flexible investment mechanisms are most needed to ensure well-timed adoption and help promising tools reach their full conservation impact.

# Constraints

This section explores the persistent and systemic constraints limiting the effective development and use of conservation technologies. Across three years of data, respondents consistently cited funding limitations, duplication of efforts, and gaps in connecting technical expertise with conservation needs. However, these challenges are not felt equally. Professionals in developing economies and women developers reported disproportionately higher barriers—especially in accessing funding, supplies, and testing opportunities. Addressing these disparities is essential for achieving inclusive innovation and maximizing conservation impact globally.

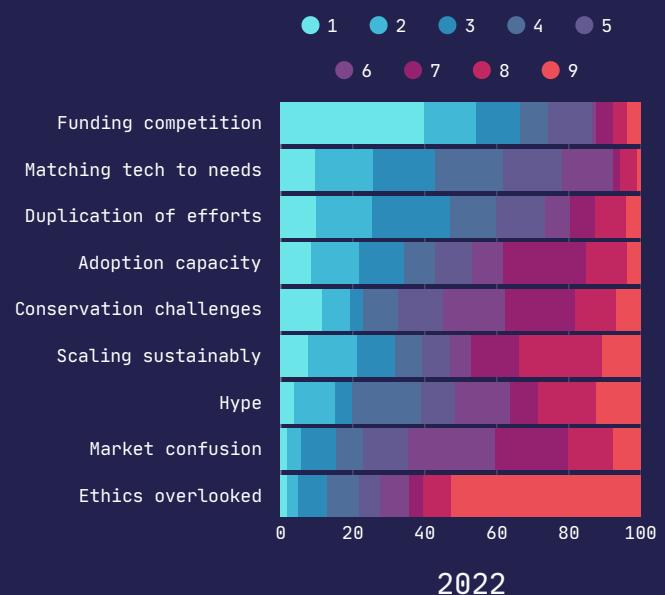
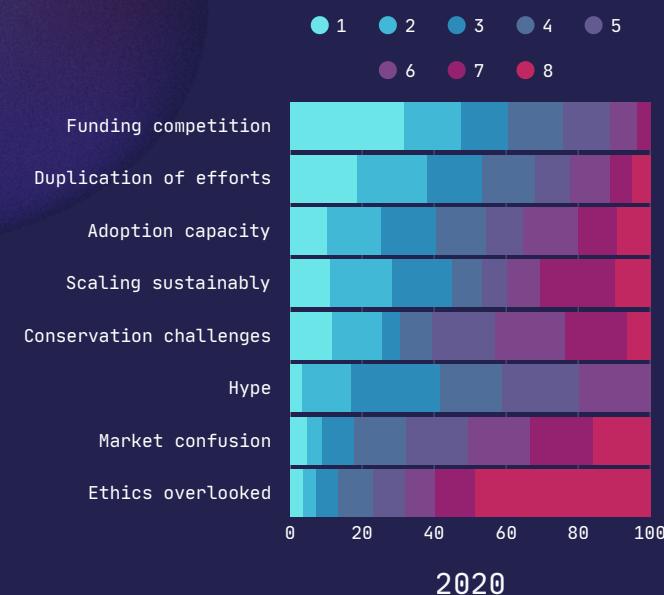
## Sector-Wide Challenges

When asked about sector-wide challenges, respondents consistently ranked competition for limited funding and duplication of efforts as the top two issues across all years.

In 2020, the leading challenges were *competition for funding*, *duplication of efforts*, and *limited capacity for adoption*. In 2021, a new category, *matching technical expertise with conservation*

needs, was introduced based on previous open-ended feedback and was ranked second, with funding and duplication still topping the list. By 2022, the overall challenge landscape remained consistent, except for *scaling sustainably* rising above *technology hype* in priority. Notably, *overlooking ethical challenges* was consistently ranked low, but was flagged as a growing concern by experts in our 2021 report.

### Ranked challenges



## Disproportionate Barriers

A core finding across this research is that constraints are not experienced equally. Geography, gender, and professional role all significantly shape access to tools, training, funding, and technical support in conservation technology. These disparities reflect systemic barriers that must be addressed to ensure the inclusive innovation called for in t

## Developing Economies

Among conservation technology end-users, those in developing economies reported significantly higher barriers across nearly every category—revealing systemic mismatches between where technologies are developed and where they're most needed.

A lack of local suppliers and support stood out as the most disproportionate constraint, with respondents 5x more likely to report this barrier. This drives up costs, causes delays, and often results in tools that aren't adapted to local ecological or infrastructural contexts.

These users were also 2.5x more likely to face barriers related to upfront costs and access to training and mentoring, and 3x more likely to report maintenance costs—showing that challenges persist across the full technology lifecycle.

## Gender

Women remain underrepresented in conservation technology, making up just 29% of surveyed users and 24.8% of developers, and they face consistently higher barriers to participation.

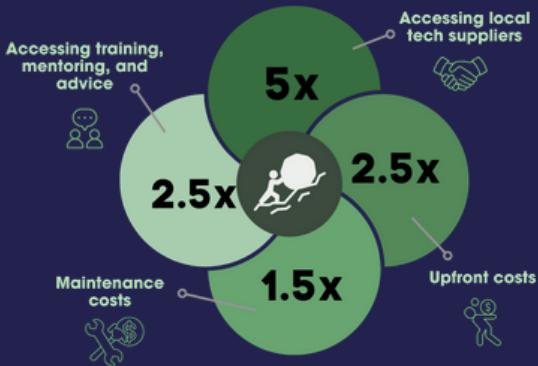
Female-identifying end-users were 1.9x more likely to report both insufficient technical skills and lack of access to training, a pairing that highlights how limited training opportunities can compound into lasting capacity gaps.

Among developers, women were 3.5x more likely to lack access to testing sites, 2.5x more likely to face challenges securing funding and relevant data, and 2x more likely to encounter user concerns around data security and privacy—barriers that directly impact their ability to lead and innovate.

### Barriers to access

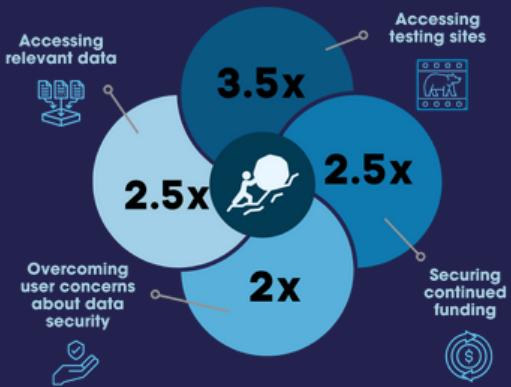
#### Did you know?

*Conservation tech end-users in countries with developing economies are more likely to struggle with...*



#### Did you know?

*Female conservation tech developers are more likely to struggle with...*



The disparities reported by women and respondents in developing economies reflect broader structural inequities that shape who can access, develop, and benefit from conservation technology. These barriers limit not only individual participation, but also the diversity, inclusivity, and real-world relevance of the tools reaching the field.

Closing these gaps will require targeted investment in regionally grounded innovation, inclusive training and mentorship, and funding mechanisms designed to lower entry barriers. Building a more equitable and enabling ecosystem for conservation technology is essential to scaling effective solutions and ensuring they reach the places—and people—where they're needed most.

## Technology End-Users

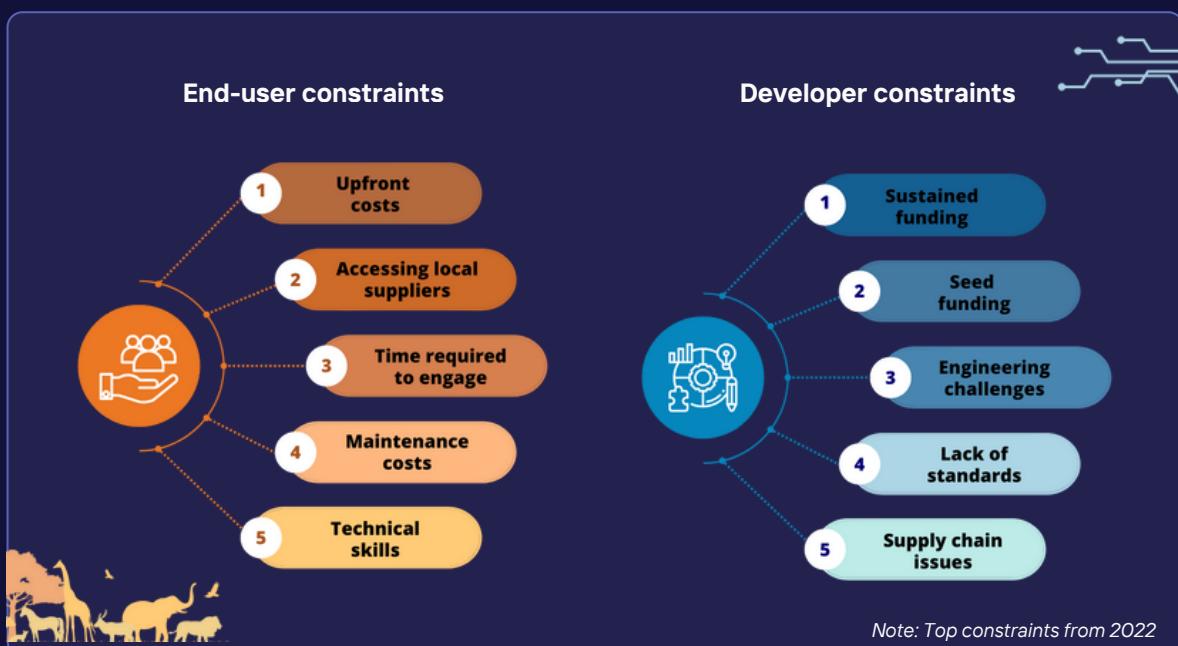
For end-users, upfront costs remained the top constraint across all three years. However, other barriers shifted notably over time. By 2022, local access to suppliers and the time required to engage had both grown in significance, while technical skill-building declined—potentially reflecting improved training availability.

- 2020: Top constraints were upfront costs, technical skills, and time required.
- 2021: Maintenance costs rose to second; local supplier access emerged as a key constraint.
- 2022: Local supplier access rose to second place; time required became the third most reported constraint.

## Technology Developers

Seed funding and sustained funding were consistently ranked as the top two barriers for developers. The third most pressing constraint shifted over time, from understanding the tool landscape in 2020 to engineering challenges in 2021 and 2022. Supply chain issues also emerged in 2021, reflecting broader global trends.

- 2020: Continued and seed funding tied for first; understanding the landscape ranked third.
- 2021: Engineering challenges moved into third place; supply chain added as a new constraint.
- 2022: Top three stabilized as seed funding, continued funding, and engineering challenges.



# Opportunities

The global conservation technology community is remarkably aligned on the most important opportunities to scale impact. Improving collaboration, accessibility, and interoperability, alongside investments in local capacity and data infrastructure, emerged as clear priorities for strengthening the sector and meeting conservation challenges more effectively.

Survey data across three years revealed strong consensus on where the sector should focus to drive progress. The most widely shared priorities included:

- Improving collaboration and information sharing (69%) to reduce duplication of efforts and accelerate innovation.
- Making tools more open, accessible, and user-friendly (63%) to lower barriers for end-users and increase adoption, particularly for those in resource-constrained regions.
- Enhancing interoperability across tools and data systems (51%) to support integrated, scalable solutions.

Respondents also emphasized the importance of investing in local capacity, especially in regions that are currently underserved or overly dependent on imported tools. Building technical skills, improving access to regionally relevant suppliers, and creating local support networks were seen as essential to equitable, long-term progress.

Finally, there was strong agreement around the need to expand capacity for data analysis and to improve how conservation data is stored, shared, and collated across scales. Together, these efforts would create a more connected, inclusive, and effective innovation ecosystem capable of rising to meet the challenges of the decade ahead.



# Looking ahead

As conservation technology continues to grow in relevance and impact, the path forward is clear: we need more inclusive infrastructure, more connected communities, and more support for the people building and using tools in the field. This report has surfaced where those investments are most needed, and WILDLABS is proud to be part of the response.

Since 2015, WILDLABS has served as the global hub for conservation technology, bringing together practitioners, technologists, and researchers across regions and disciplines. In 2022, we saw the first measurable evidence that WILDLABS members experience fewer barriers across key areas like access to training, support, and collaborators. These findings confirm what we've long-heard anecdotally: community reduces isolation, and shared knowledge accelerates impact. We use insights from this research to shape programs that respond to sector needs—building accessible resources, supporting diverse voices, and closing gaps in funding, training, and visibility.

## WILDLABS' impact

Active **WILDLABS** members are

**1.5x**

*less likely to struggle with common conservation tech challenges, including...*



Accessing relevant training



Accessing mentoring and advice



Matching tech expertise to conservation challenges

## Get Involved

WILDLABS is committed to making our global community and programs as inclusive as possible. In our research, this means ensuring that the collective voice we represent increasingly reflects underrepresented user and developer communities. One important way you can help is by participating in our annual surveys and sharing them widely with people we may not yet be reaching.

Beyond the State of Conservation Technology, WILDLABS runs a growing suite of programs that advance our vision of conservation efforts everywhere benefiting fully from accessible, affordable, and effective modern technology.

These programs span our three pillars:

1. Community, focused on bringing people together and making information discoverable;
2. Research, aimed at identifying evolving needs and opportunities; and
3. Support, powered by cross-sector partnerships that unlock resourcing to answer shared needs.

We are a non-profit partnership led by a dedicated global team and a Steering Committee comprised of representatives from Conservation International, Fauna & Flora, the Wildlife Conservation Society, and World Wildlife Fund. There are a number of ways to support our growing community, including by joining it!

# Acknowledgments

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First and foremost, we thank all of our survey respondents for their time and thoughtful contributions—this research would not be possible without you.

This research is led by Talia Speaker of WILDLABS, with support from Stephanie O'Donnell of WILDLABS and Jennifer Solomon of Colorado State University. All analyses presented in this report were conducted by Fanni Varhelyi as part of a WILDLABS internship at World Wildlife Fund US (WWF), with narrative and graphics support from Talia Speaker. Funding and in-kind support from WWF and Arm made this work possible. Data collection was approved under Colorado State University Institutional Review Board protocol 20-10146H.

This report is part of a growing, longitudinal research effort supported by WILDLABS and our partners to create a better future for conservation technology informed by community insights. We are always seeking collaborators and supporters to help make it as relevant, inclusive, and impactful as possible. If you are interested in contributing or learning more, please get in touch.

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