Strengthening Ecological Monitoring in New Mexico

Introduction

New Mexico's landscapes are as diverse as they are beautiful, spanning from high-desert shrublands to dense alpine forests. However, these ecosystems face unprecedented challenges from drought, wildfire, and climate change. To protect these resources, the New Mexico Forest and Watershed Restoration Institute (NMFWRI) and the New Mexico Forestry Division (NMFD) recognized a critical need and launched a collaborative project to better identify, strengthen, and implement the resources necessary to collect, analyze, and share critical ecological monitoring data across the state.

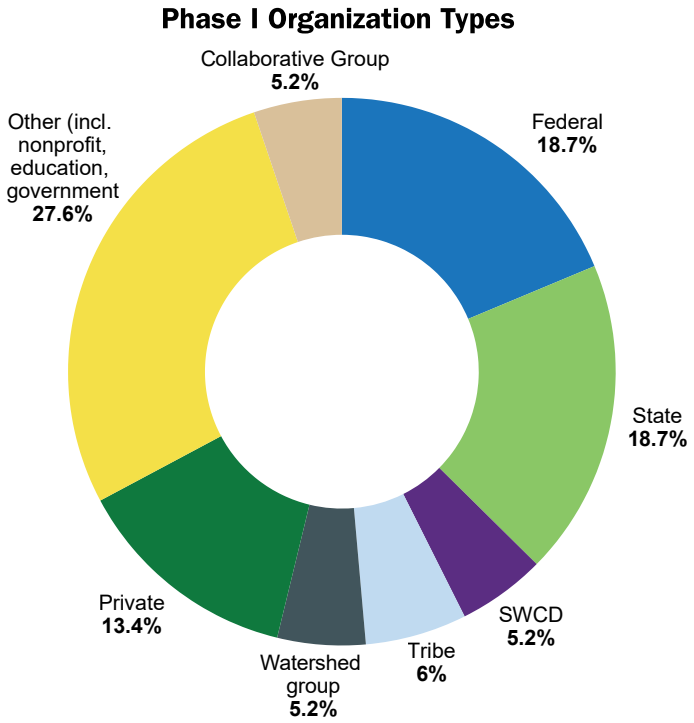
This report summarizes a multi-year effort to understand the current state of ecological monitoring—the practice of tracking changes in nature over time. The goal was to move away from isolated projects and toward a statewide network where data is shared, challenges are tackled collectively, and every dollar spent on restoration is backed by solid evidence.

The three-phase initiative designed to bridge gaps in current monitoring efforts included:

- **Phase I (2022–2023):** Mapping the Monitoring Landscape. We began by surveying individuals and organizations across New Mexico to understand who is conducting ecological monitoring, where this work is happening, and what is being studied.
- **Phase II (2022–2023)**: Identifying Needs and Challenges. Building on our contact list, we conducted a second, more detailed survey with active participants to pinpoint the specific indicators they track and the common obstacles they face in their work.
- **Phase III (2024–2025)**: Collaboration and Action. The final phase focused on sharing these findings through workshops and reports, inviting stakeholders to participate in focus groups to discuss the results and develop actionable opportunities for the future of New Mexico's ecological health.



Ecological monitoring in New Mexico is as diverse as its landscapes and communities. *Photo by Kathryn Mahan*



The chart above represents the organization types of the Phase I survey respondents.

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Phase I: Who is doing the monitoring?

The first step was to answer a fundamental question: Who is actually doing the work? In 2022, we launched a massive outreach effort, contacting over 800 individuals across the state. We reached out to federal agencies like the Forest Service, state departments, tribal governments, and local non-profits.

The findings from Phase I revealed an energetic but fragmented community. We discovered that while there are hundreds of people monitoring New Mexico's health, they often work in silos. Of the 164 professionals who responded, we found that nearly half belong to large organizations with more than 30 employees. This suggests that while big agencies hold the most resources, there is an important group of small teams—often fewer than five people—who are doing essential work on the ground but may lack the technical support of their larger counterparts.

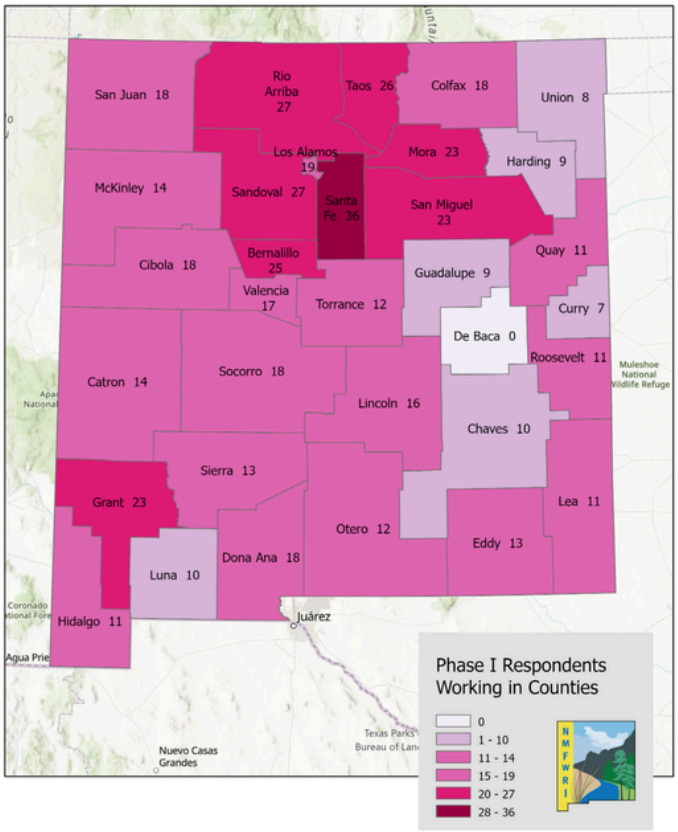
One of the most important findings was the distribution of effort. We found that monitoring is happening across a wide variety of land ownership types (private, state, federal, and tribal) and landscapes (forest, riparian, bosque). We also learned that the average respondent is highly engaged, spending significant time ensuring their data is accurate. This phase proved that there is a wealth of information out there; the challenge is that it is currently scattered across dozens of different organizations. Phase I successfully mapped the "who" and "where," creating a first-of-its-kind directory of monitoring activity that covers every corner of the state, from the Gila to the Sangre de Cristo Mountains.

Phase II: What are the challenges?

During Phase II, we shifted the focus to the "how" and "why." We conducted an intensive study with 28 lead monitoring organizations that spent, on average, over half an hour each detailing their operations. This phase was about identifying the pain points that prevent data from being as useful as it could be.

This phase revealed that monitoring in New Mexico is highly complex. A key finding was the diversity of the type of land ownerships (federal, private, tribal), the landscape

Phase I Survey Results:
In which counties do you conduct monitoring?



The map above shows geographic distribution of monitoring efforts across the state. Respondents indicated work in all counties except De Baca.

type and what is being measured at those sites. Teams are tracking everything from basal area (the density of trees) to canopy cover and surface fuels in forests, to stream physical and biological data as well as riparian vegetation. However, the survey revealed a major hurdle: a lack of standardized methods. Because different groups use different tools to measure the same things, it is often difficult to compare data across a whole watershed.

Furthermore, Phase II highlighted a resource gap. Many respondents noted that while they have the passion and the people, they struggle with long-term data storage and the high cost of advanced monitoring technology. This phase proved that the desire to collaborate is high, but the infrastructure to support that collaboration—like shared databases and uniform training—is still needed and under construction. The survey also revealed a lack of capacity.

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Common Challenges

The challenges on the right often lead to delayed reporting, underutilized data, and missed opportunities for adaptive management.

78%
of respondents reported they had seen funding mechanisms act as a disincentive to using monitoring results.

People and Capacity

- Staffing shortages
- Limited training
- Competing workloads
- Loss of trained staff
- Lack of long-term funding

Data Management and Methods

- Inefficient workflows
- Insufficient capacity for data entry
- Quality control and data management
- Standardization or analysis
- Challenges with data access

Technology and Logistics

- Equipment and software costs
- Technical support permissions
- New technology training

Strategy and Decision-Making

- Unclear management questions
- Competing priorities
- Political barriers
- Limited use of findings

Phase II Findings, *continued*

While larger organizations are well-staffed, many smaller groups are operating on shoestring budgets with high staff turnover and/or volunteers. This leads to data gaps where monitoring might start strong but fade away after a year or two because of a lack of consistent funding.

Phase II showed us that for monitoring to be successful, it needs to be sustainable. We need to move away from short-term grants and toward long-term investments in our people and our data collection and repository systems.

Phase III: What is the current status of Monitoring in New Mexico?

The final phase of the project focused on the human element of monitoring. In April, 2025, the Practical Skills for Restoration Professionals Workshop was hosted by NMFWRI at New Mexico Highlands University (NMHU) where we took the results from the first two phases back to the community through workshops and focus groups.

The findings from these sessions showed a strong consensus: New Mexico needs a Central Hub for monitoring information. Participants expressed that they don't just want to collect data; they want to see that data influence policy and restoration funding. Phase III revealed that the most valuable resource we have is the collective expertise of our land managers. By creating spaces for these experts to meet and share lessons learned, we are building a more resilient management system.

From tribal leaders to local ranchers, there is a desire for monitoring data to be transparent and accessible. We found that the most successful projects are those where the community is involved in the monitoring process. This phase has highlighted the need for more workshops, better training materials, standardized protocols, and a more inclusive approach to how we define success in the landscape.

Summary of Findings and Next Steps

When we look at all three phases together, three key themes emerged:

1. **Unity of Organizations:** We have a large, passionate workforce, but they need better ways to talk to one another.

2. **Central Hub**: We need a statewide, web-based data repository that makes environmental data accessible to everyone, provided there is sufficient technical support.
3. **Standardization**: We need a common language for data so that a measurement taken in the north means the same thing in the south.
4. **Support and Training:** We must provide technical and financial support to smaller organizations to ensure no part of the state is left unmonitored.

This report serves as a call to action. By investing in a statewide monitoring network today, we are ensuring a healthier and more fire resilient landscape in New Mexico tomorrow. By moving forward with a focus on collaboration, standardization, shared technology and repository, and consistent communication, we can ensure that our forests and watersheds remain healthy for generations to come.

The path to a more resilient New Mexico involves transforming these fragmented efforts into an organized statewide ecological strategy.

- The NMFWRI is well-positioned to lead the development of technical resources, training, and partner coordination.

- The NMFD has a key role in developing policies that provide long-term funding stability and incentivize the open sharing and use of monitoring data in strategic decisions.

Recommendations for New Mexico Legislators

Transform New Mexico's fragmented monitoring efforts into a coordinated, statewide system. To make ecological monitoring a lasting public investment rather than an unfunded responsibility, we urge legislators to take five key actions:

1. **Establish Sustained Statewide Funding**
   - Secure long-term statewide funding for an ecological monitoring network.
   - Support inter-agency and partner coordination and maintain a trained monitoring staff beyond individual grant cycles.
2. **Fund a Statewide Centralized Data Repository**
   - Designate a lead institution to maintain a shared,
   - web-based platform for data discovery, access, management, and analysis.
   - Establish protections for sensitive and Tribal data sovereignty.
3. **Invest in Statewide Training and Technical Assistance**
   - Fund standardized monitoring protocols and hands-on training.
   - Provide data management, analysis and technical support to Tribes, local governments, nonprofits,
   - and small community organizations.
4. **Mandate Monitoring and Data-Sharing Plans for State Funding**
   - Require publicly funded monitoring projects to include clear monitoring objectives, standardized methods, data stewardship, and reporting standards.
   - Maintain flexibility for local field conditions and Tribal data governance.
5. **Align Funding Structures with Adaptive Management**
   - Allow eligible monitoring costs to extend beyond short-term project deadlines.
   - Empower agencies and grantees to use monitoring findings to evaluate real-world outcomes and guide future public investments.

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