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Heaton, M.[1], Scow, B.[2], Brischke, A.[3], Esplin-Iverson, R.[4], Audoin, F.[5], Hazelwood-Spanyers, K.[6]
[1]Assistant Professor Ag and Natural Resources, Utah State University Extension, Panguitch, Utah, 84759
[2]Professional Practice Extension Associate Professer Agriculture & 4-H, Utah State University Extension, Hurricane, Utah, 84737
[3]Mohave County Extension Director Area Assistan Agent, Agriculture & Natural Resources, University of Arizona Cooperative Extension, Kingman, Arizona, 84601
[4]Professional Practice Extension Assistan Professor Agriculture and Natural Resources, Utah State University Extension, Cedar City, Utah, 84720
[5]Assistant Professor Cooperative Extension Specialist Plant0Herbivore Interactions and Targeted Grazing, University of Arizona Cooperative Extension, Tucson, Arizona, 85721
[6]Assistant Agent, Livestock, University of Arizona Cooperative Extension, Prescott, Arizona, 86301

Extension-Led Collaboration for Multi-Use Rangeland Stewardship

Abstract

Public rangelands face increasing pressure from competing land uses, regulatory complexity, and ecological variability, requiring collaborative, science-based management approaches. The Arizona/Utah Range Livestock Workshop and Tour were established in 1978 as a neutral, Extension-led forum to address long-standing conflict among ranchers, agencies, and conservation interests on the Arizona Strip. This manuscript presents a hybrid Extension case study and cooperative model demonstration examining how sustained engagement over 47 years influenced education, behavior, and shared stewardship capacity. Long-term participation records (1978–2025) and standardized evaluations (2015–2025) were used to assess attendance, curriculum evolution, knowledge gain, and management adoption. Results show more than 12,500 total participants, consistent rancher engagement (40–50%), expanding interagency participation, strong knowledge gains across instructional eras, and that 68% of 2025 respondents adopted practices that improved profitability. Agency-reported outcomes indicate improved coordination, reduced conflict, and strengthened producer–agency communication. Collectively, these findings

demonstrate the effectiveness and national transferability of this cooperative Extension model for multi-use rangeland stewardship.

Abbreviations: United States Bureau of Land Management (BLM), United States Forest Service (USFS), Utah State University (USU), University of Arizona (U of A), Natural Resources Conservation Service (NRCS)

Keywords: rangeland, public lands, grazing, livestock, education

Introduction

The Arizona Strip is a dry, arid region north of the Grand Canyon and south of the Utah border, encompassing more than three million acres of predominantly public land (Altschul et al., 1989). Since the late 1800s, the region has supported livestock grazing for ranchers in southern Utah, northern Arizona, and southern Nevada (Grahame et al., 2002). However, severe overgrazing during the late nineteenth and early twentieth centuries caused substantial ecological degradation (Bostick, 1990). Although the Taylor Grazing Act of 1934 ended uncontrolled grazing, conflict escalated in the 1970s following the Hot Desert Environmental Impact Statement and the proposed listing of the Mojave Desert tortoise (Robinson et al., 1991). These actions resulted in grazing allotment closures, economic losses for ranchers, and long-term tension between permittees and federal agencies. Such tensions persist within a policy framework that often limits flexible negotiation among competing land users (Reagan, 2018, Garn & Calee, 2019).

Recognizing that conflict, regulatory pressure, and limited communication were constraining effective stewardship, Extension was engaged as a neutral, science-based facilitator to bring ranchers, agencies, and conservation interests together through a structured educational and collaborative program.

Materials and Methods

In 1978, Utah State University Extension and University of Arizona Cooperative Extension partnered with federal land management agencies and livestock producers to

establish the Arizona/Utah Range Livestock Workshop and Tour. The program was developed in direct response to overgrazing concerns, regulatory changes, and long-standing conflict between ranchers and public land agencies. The goals of the workshop were to improve communication among stakeholders, strengthen producer understanding of science-based grazing and monitoring practices, and provide a neutral forum for collaborative problem solving. Over time, the workshop became a consistent venue for dialogue, learning, and coordination, supporting improved working relationships and more cooperative approaches to public land management, an approach that parallels Extension's broader national role in facilitating complex, multi-stakeholder resource issues.

The primary target audience includes livestock producers who graze on public lands and state and federal land management personnel responsible for grazing administration, rangeland monitoring, wildlife management, and compliance. Participation from recreation, conservation, university, and Extension audiences has expanded over time, reflecting the program's evolution into a multi-stakeholder learning forum. The workshop is delivered as a three-day program consisting of two identical classroom-based workshop days offered in separate locations, followed by a shared field tour on active grazing allotments. Topics are selected annually using participant evaluations and direct input from producers, agency staff, and Extension partners. While early program years focused primarily on grazing systems and livestock production, recent agendas have expanded to include drought adaptation, public lands policy, recreation impacts, monitoring, ranch economics, and technology integration. As the ranching population has aged (Zulauf, 2024), the workshop has adapted to remain relevant to both long-established producers and the next generation of land stewards. Since 1978, the Arizona/Utah Range Livestock Workshop and Tour have engaged more than 12,500 participants across the Arizona–Utah public lands region.

Results

Outcomes and impacts were evaluated using long-term participation records from 1978–2025 and participant evaluation data from 2015–2025. Variables analyzed

included attendance, participant occupation, curriculum topics, self-reported knowledge gain, management and technology adoption, and participation in collaborative monitoring and planning. All data were collected through voluntary, anonymous program evaluations with no personally identifiable information and therefore qualify as program evaluation exempt from Institutional Review Board (IRB) oversight. Data were interpreted collectively to examine relationships among participation, education, applied behavior, and collaborative stewardship outcomes without implying direct causation.

Participation Trends

From 1998–2025, the workshop engaged over 7,800 participants, with annual attendance increasing from approximately 120 participants per year in the late 1990s to more than 560 participants in 2025. As shown in Figure 1, ranchers consistently represented the largest participant group (40–50%), while state and federal agency personnel formed the second-largest group, reflecting the workshop's intentional design as a shared learning space for both regulated producers and regulatory agencies. Participation from students, Extension, and other affiliated groups remained smaller but consistent. Two notable deviations occurred during this period. In 2020, when the workshop was delivered virtually, rancher participation declined while agency participation increased. In contrast, 2025 showed elevated participation across nearly all categories, coinciding with a nationally recognized keynote speaker and expanded technology-focused programming. These trends demonstrate both resilience of the core rancher audience and responsiveness of attendance to program format and content.

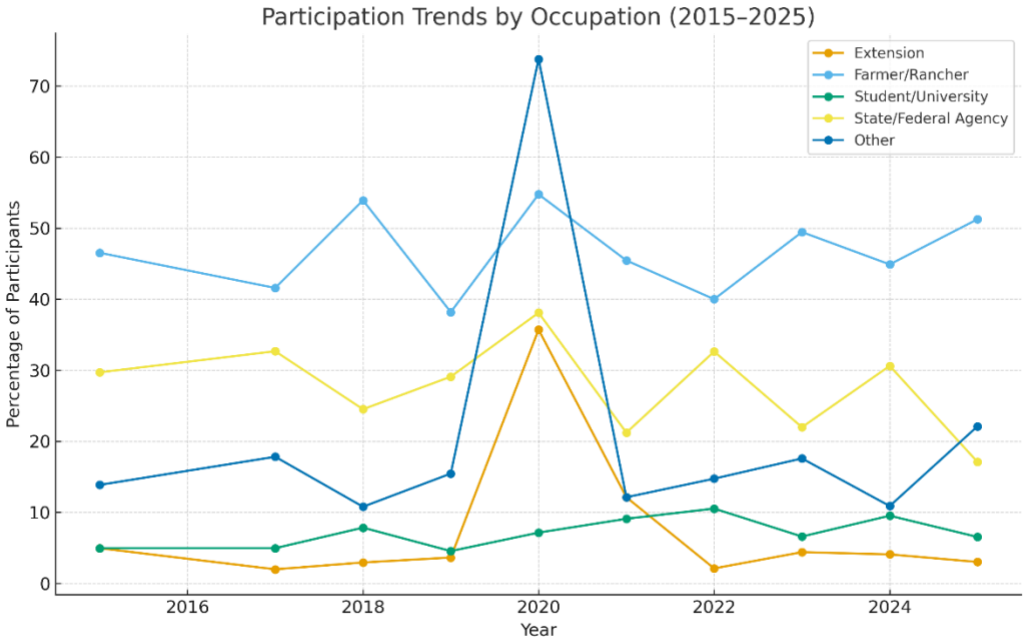

Figure 1. Participation in Arizona/Utah Range Livestock Workshop and Tour by Occupation Over a 10-year Period

Curriculum Evolution

Curriculum evolution is documented in Figure 2, which illustrates how instructional priorities expanded as public land management became more complex. During the 1980s and 1990s, workshop content emphasized livestock production and grazing systems, with limited attention to wildlife, policy, or recreation. Beginning in the 2000s, curriculum increasingly incorporated rangeland monitoring, wildlife interactions, decision-making and risk management, and public lands policy. By the 2010s and 2020s, additional growth occurred in technology and innovation and multi-use and recreation issues. This progression demonstrates that the workshop did not remain static but adapted to shifting ecological, regulatory, and social pressures on western rangelands. This long-term diversification aligns with participant feedback from the past decade, in which 86% of respondents identified multi-use stewardship topics as high priority, approximately double the proportion reported during earlier program years.

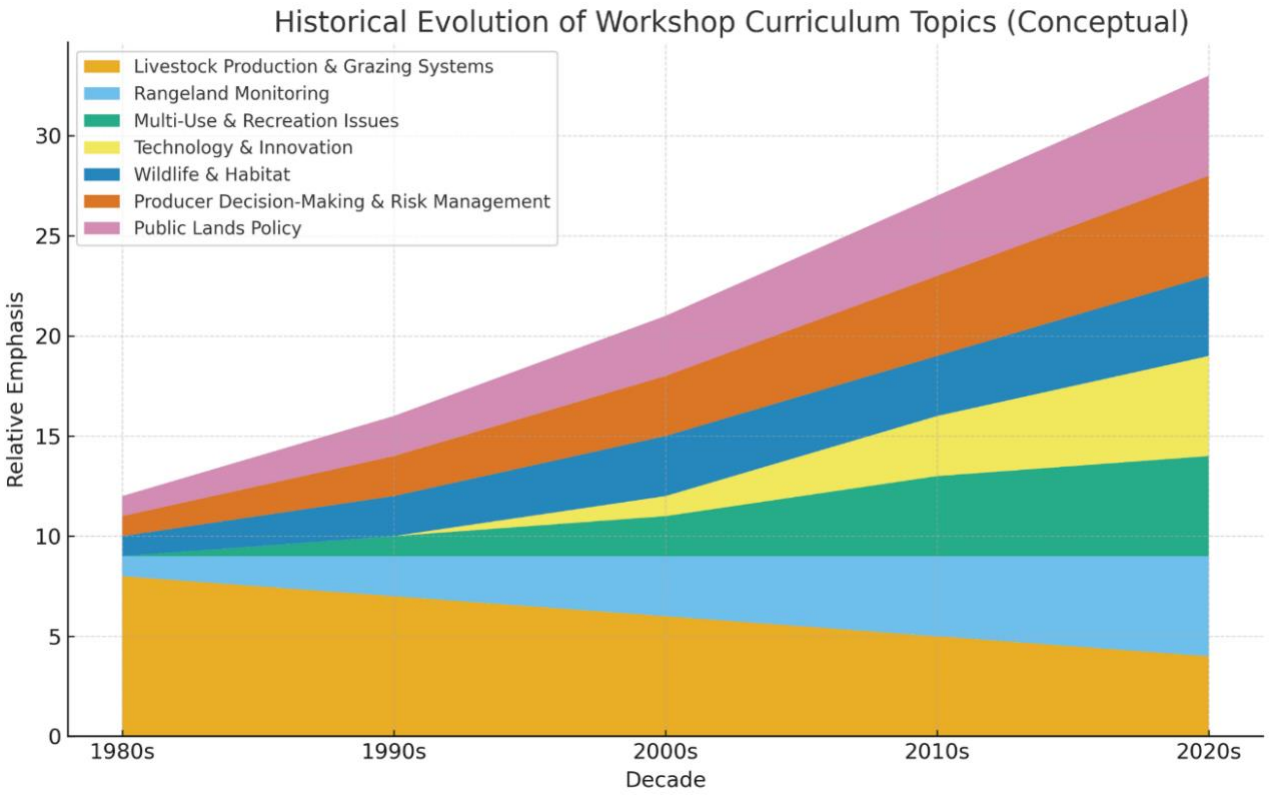

Figure 2. Historical Workshop Topic Evolution, 1978–2025

Educational Outcomes

Educational outcomes across instructional eras demonstrate the workshop's sustained effectiveness in increasing participant knowledge (Figures 3 and 4). Figure 3 (2015) shows the strongest reported learning gains in livestock production, grazing management, animal health, and fire-related rangeland responses, with increases ranging from approximately 20% to over 60%, depending on topic. In contrast, Figure 4 (2025) reflects a broader, technology- and policy-oriented instructional focus, with participant-reported knowledge gains ranging from 32% to 51%, highest for electronic identification and traceability, ranch economics, drone use, and Arizona Strip history and utilization policy. Moderate but consistent gains were also reported in both years for livestock handling, grazing management and intensity, ranch transition, and the role of livestock on the range. Together, these results demonstrate that as the curriculum

evolved, the workshop remained highly effective at increasing participant knowledge across both traditional production and emerging management domains.

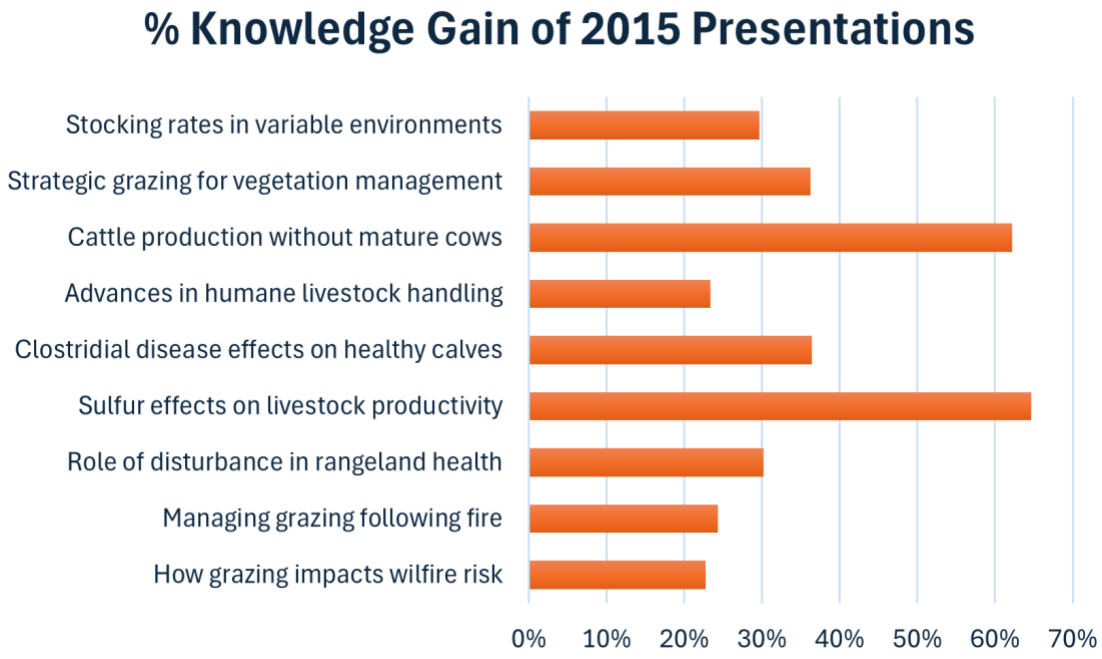

Figure 3. Workshop Topics and Percent Knowledge Gain in 2015

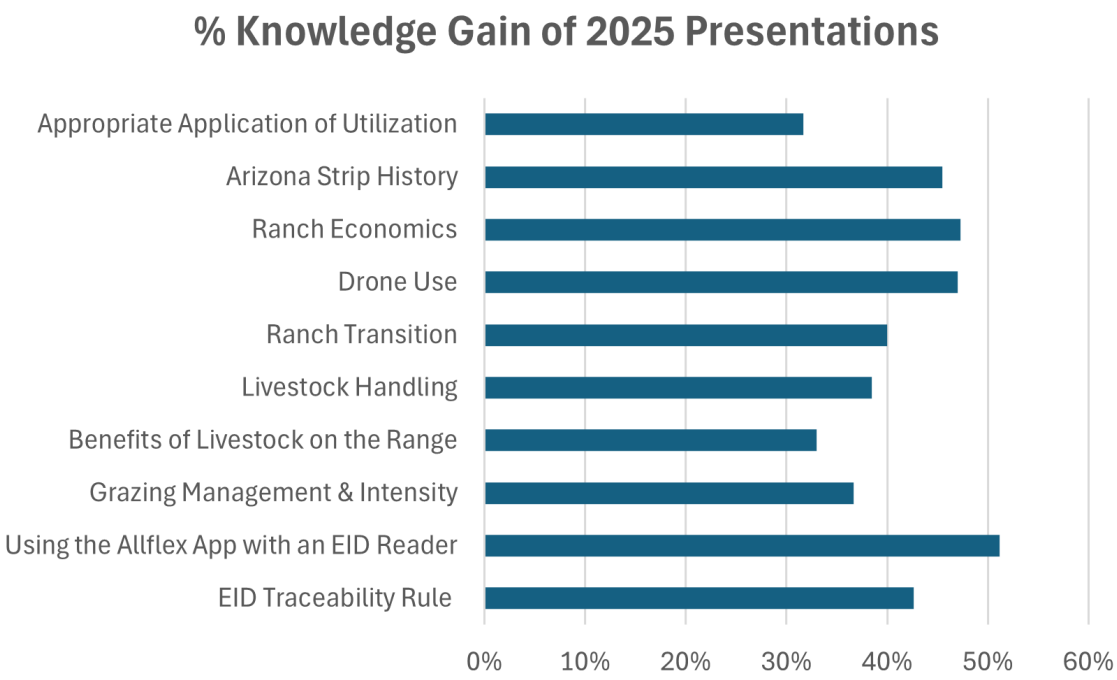

Figure 4. Workshop Topics and Percent Knowledge Gain in 2025

Behavioral and Systems-Level Impacts

Behavioral and applied management impacts were documented through 2025 evaluation data. Among all respondents (n = 189), 68% reported adopting at least one recommended management practice that increased profitability because of previous workshop participation. Common adoptions included adjustments to grazing rotation, improved livestock distribution, development of drought contingency plans, and incorporation of new technology tools. These results demonstrate program influence on producer decision-making while acknowledging that adoption occurs within broader economic, environmental, and regulatory contexts.

At the systems level, outcomes extend beyond individual practice change into cross-agency coordination and shared stewardship capacity. Agency personnel reported reduced conflict with grazing permittees, particularly related to recreation pressure, and increased producer engagement in planning groups where consistent workshop attendance occurred. While these observations do not permit direct causal attribution, BLM and NRCS allotment monitoring documentation and cooperative photo-monitoring

records associated with participating allotments show more consistent grazing use levels, more strategic livestock distribution, and clearer communication about objectives and outcomes.

Collectively, these outcomes demonstrate long-term educational gains, sustained behavioral adoption, and measurable growth in collaborative land management capacity. The convergence of participation stability, curriculum evolution, knowledge gain, management adoption, and cross-agency coordination indicates that the program's impact extends well beyond short-term learning.

Discussion

Results from this long-term evaluation demonstrate that the Arizona/Utah Range Livestock Workshop and Tour remained highly effective in achieving its core educational and collaborative objectives across multiple decades. Participation stability, persistent rancher engagement, expanding curriculum scope, and consistently strong knowledge gains indicate that the workshop adapted successfully to changing ecological, regulatory, and social conditions without losing instructional effectiveness. The comparison of 2015 and 2025 knowledge gain data shows that as the curriculum broadened to include technology, economics, and policy, the program maintained strong learning outcomes in both traditional production topics and emerging management domains. This sustained effectiveness across instructional eras directly addresses concerns about program stagnation and supports the workshop as a durable Extension education platform rather than a static training event.

Beyond individual learning, the program's systems-level influence is evident in strengthened cross-agency coordination and producer engagement in public-land planning. Agency-reported reductions in conflict and increased producer participation in planning groups suggest meaningful improvements in shared stewardship capacity. While these outcomes remain observational, they align with broader literature documenting the value of cooperative monitoring, joint planning, and Extension-

facilitated dialogue in contested resource settings (Tanoue et al., 2019). Collectively, the evidence indicates that the workshop functioned not only as an educational program but also as long-term social infrastructure supporting adaptive management on multi-use rangelands.

Although the Arizona Strip is geographically unique, the cooperative Extension model demonstrated here is broadly transferable. Core program elements—including neutral facilitation, recurring engagement, partner-driven curriculum development, field-based learning, and long-term relationship continuity—apply nationally in Extension programming contexts such as water management, forestry, fuels management, agriculture–urban interface conflicts, conservation planning, and climate adaptation.

Conclusion

The Arizona/Utah Range Livestock Workshop and Tour demonstrate that sustained, cooperative Extension programming can generate long-term educational effectiveness, behavioral adoption, and cross-agency collaboration in complex public-land systems. Over more than four decades, the program maintained strong participation, evolved its curriculum in response to changing stakeholder needs, and consistently produced measurable knowledge gains across both traditional production and emerging management topics. Recent evaluation data further show that a majority of participants implemented workshop-informed practices that improved profitability, confirming that educational outcomes translated into applied economic benefits.

At the systems level, the workshop contributed to improved communication, shared monitoring, and cooperative planning between ranchers and land management agencies. While causal inference is not possible with the available data, the convergence of participation stability, curriculum evolution, learning gains, management adoption, and reported conflict reduction affirms the workshop’s effectiveness as a durable Extension-led platform for shared stewardship.

Plans for the Arizona/Utah Range Livestock Workshop and Tour include transitioning all participant evaluations to a centralized online platform to improve response rates, ensure consistent data collection across years, and support real-time assessment of program outcomes. The program also plans to implement anonymous participant identifiers to enable longitudinal tracking of knowledge retention, behavioral adoption, and economic impact while maintaining confidentiality. Evaluation efforts will further differentiate outcomes by participant group to more clearly document targeted educational and operational benefits. In addition, the workshop will work with agency and conservation partners to integrate selected ecological monitoring indicators where feasible, strengthening the ability to link educational outcomes and management change to measurable on-the-ground responses.

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