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Ten Years of Wolf-Livestock Interactions and Cooperative Extension Work in Northern California

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ABSTRACT: Livestock-predator interactions are common-place on the millions of acres of public and private ranches throughout California. The toolbox to mitigate these interactions has ebbed and flowed over the years with changes in political climate and public interest in predators. The first California gray wolf in recent history crossed the California/Oregon state line border on December 28, 2011, thus making gray wolves the most recent predator to be added to the livestock-predator equation. With them came a whole new set of challenges as well as new rules for producers to follow as wolves are provided protection under the Federal and California Endangered Species Act. The California wolf population has currently grown to over seven known established packs that have established throughout the state. With this increase in wolves also came impacts to the state's \$3.63 billion range livestock industry including direct losses through depredation of cattle and sheep. University of California Livestock and Natural Resources advisors in northern California have been working on communicating with and educating the public and ranchers alike about livestock-predator interactions, conducting and supporting research, and engaging in efforts to inform policy in this field for 10 years. By utilizing a diverse set of outreach techniques, hands-on-workshops, surveys and conversations, advisors have built capacity to address livestock-wolf interactions and made lasting impacts with producers. A discussion about successes and failures, and future work will be included.

KEY WORDS: *Canis lupus*, education, livestock, non-lethal control, predation, wildlife management, wolf

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INTRODUCTION

Since the extirpation of gray wolves in the early 20th century, California ranchers have a long history of protecting livestock from bears, mountain lions, coyotes, and predatory birds. Both lethal and non-lethal control methods exist and the ranching industry is fairly well-adapted to their control. After wolf "OR-7" entered California in 2011, ranchers began seeking information about managing interactions with a predator that none of the current generations of producers had any experience with. University of California Livestock and Natural Resources advisors in northern California have been working on communicating with and educating the public and ranchers alike about livestock-predator interactions, conducting and supporting research, and engaging in efforts to inform policy in this field for 10 years, 2014-2024 (Figure 1).

METHODOLOGY

After the first wolf came into California, the first pack was established in spring 2015 (California Department of Fish & Wildlife 2025) and the first confirmed livestock depredation occurred later that year. By this time, gray wolves had been listed as endangered under the California Endangered Species Act, and the California Wolf Management Plan was being drafted. University of California Cooperative Extension Advisors (UCCE) immediately began to educate producers and the public about the potential impacts of wolves from peer-to-peer workshops with producers from other western states who already

ranch in wolf territory. These wolf facilitation workshops showed producers how to protect and investigate a potential wolf depredation, introduced them to non-lethal protection tools, and gave local producers firsthand interactions with peers ranching with wolves.

UCCE also began a series of needs assessments in 2016 to gauge the baseline attitudes and challenges that California producers were already facing and their concerns about the future impact of wolves. A total of 85 cattle producers and 25 sheep and goat producers were asked about direct and indirect impacts from all predators (including wolves) as well as the perceived effectiveness of a range of livestock protection tools. This survey will be repeated in 2026 to measure changes in impacts and tool effectiveness now that wolves are more established.

In 2016, the California Wolf Management Plan was adopted with no lethal control option for wolves in California. This was seen as a major blow to the livestock industry. UCCE again acted quickly by starting to produce livestock-predator hub fact sheets and a more comprehensive Livestock Protection Tools for California Ranchers publication (Macon et al. 2018). In 2018-2019, this publication was bolstered with hands-on workshops focusing on non-lethal livestock protection tools. These workshops were held on ranches in Northern California, in most cases with USDA-Wildlife Services, and showcased several non-lethal tools.

One tool gap identified was how to most effectively remove livestock mortality carcasses from the landscape

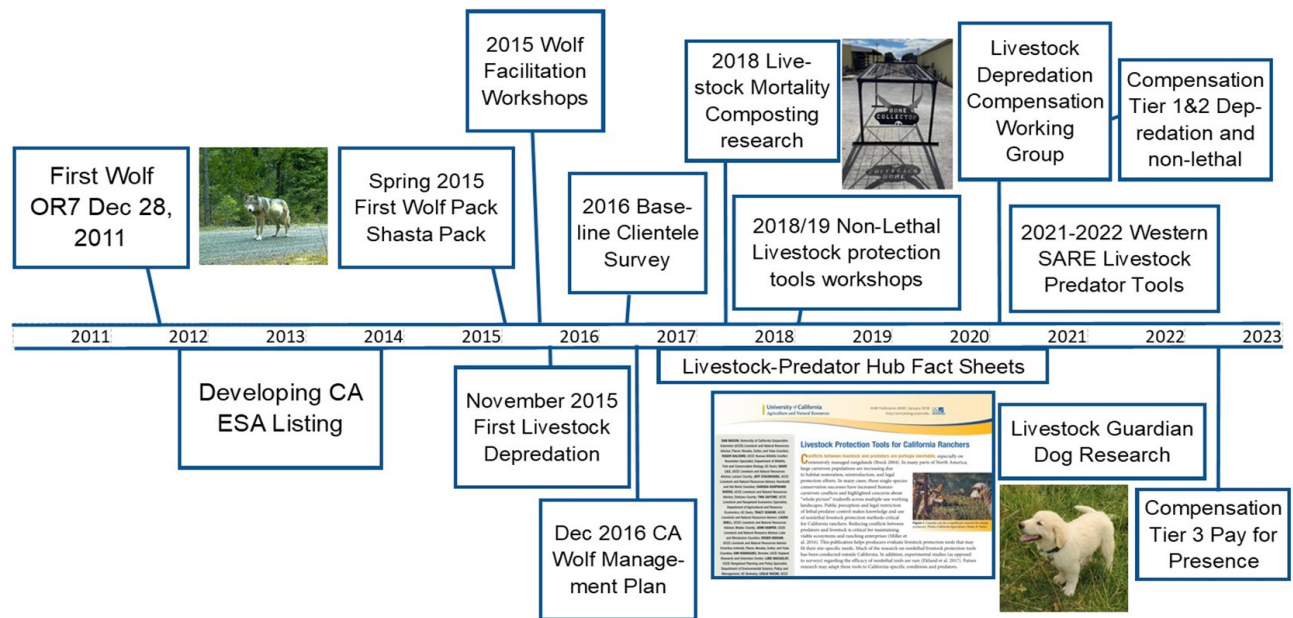


Figure 1. Timeline of UCCE wolf engagement.

and reduce conflict around bone piles. In 2018, livestock mortality composting research started in Tulelake. This research continued and morphed into a demonstration site. Results from the study comparing the compost site and nearby bone piles was published in the 2022 Vertebrate Pest Conference Proceedings (Stevens et al. 2022) and demonstrated that predators were far more likely to scavenge from bone piles than from compost sites. The next step to this research was changing California Code to allow for mammalian tissue in composting.

Several projects involving the study and use of Livestock Guardian Dogs (LGD) began across the region. This work included tracking LGD movement in extensive and intensive management systems in privately-owned foothill annual rangelands and federal rangelands in the Sierra Nevada. In addition, UCCE conducted a case study on bonding LGDs with cattle (in partnership with private ranchers). Preliminary results suggest that LGDs are very effective at protecting non-lactating ewes in open range settings, and that bonding LGDs with cattle can be accomplished using techniques typically used for bonding LGDs with small ruminants. Finally, UCCE advisors published a variety of extension publications and journal articles focused on selecting and training LGDs, as well as on the economics of using LGDs (Macon 2020, Macon and Whitesell 2021a, Macon and Whitesell 2021b, Macon and Whitesell 2022).

During the time frame from 2020-2023 the development of tools and outreach workshops continued and UCCE moved into the research to policy stage. UCCE facilitated meetings between local producers and state and federal agencies and took a role in helping to shape compensation policies and tools. This facilitation and partnership with several agencies led to the tiered compensation program implemented by California Department of Fish and Wildlife (California Department of Fish & Wildlife 2024).

CONCLUSION

Our methodology for educating and preparing producers for wolves was broad, ranging from peer-to-peer learning, facts sheets and publications, hands-on and community workshops, research addressing data and policy gaps and then addressing policy development. These 10 years changed the predator landscape in California significantly but even more significant impacts to ranchers were forthcoming.

The CDFW wolf compensation program was started in 2021. It used UCCE research and research from other states with UCCE representatives serving on the compensation sub-committee. Sub-committee members then held stakeholder workshops and sought feedback from local livestock producer groups. After the program was developed, UCCE performed outreach education and training on applications. The compensation program originally was direct loss only and then expanded to three tiers: direct loss, nonlethal deterrents and pay for presence. The program allocated \$3 million to northern California livestock producers and quickly ran out of funding once wolf numbers started to increase.

There are tons of quotes talking about the best time to prepare for dire times being the present or prepare for rain when the sun is shining. Although these 10 years might have been the best time to educate and prepare the Northern California livestock producers for wolves, we found that relatively few producers were in the mindset to start thinking about the wolf's potential future impacts. Now that wolves have demonstrated significant direct impacts to livestock producers, these extension products, applied research, and policy strategies are still relevant and easy to pull off the shelf, but in some cases the education component has started over.

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