Study finds drought fuels invasive species after wildfires

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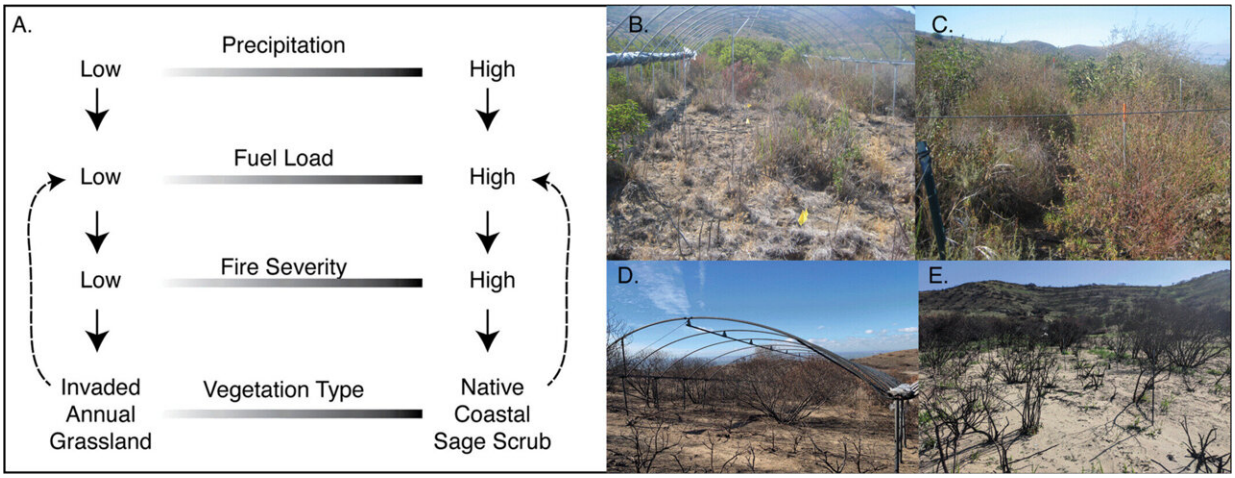

(A) Hypothesized relationships between prefire precipitation, fuel load, fire severity, and vegetation type in coastal sage scrub. Dotted lines indicate feedbacks. Actual precipitation values are provided in Appendix S1: Figure S1. Credit: *Ecology* (2024). DOI: 10.1002/ecy.4265

In a study recently published in the journal Ecology, University of California, Irvine scientists uncover the intricate dance between drought, wildfires and invasive species in Southern California's coastal sage scrub ecosystems.

Titled "Long-term drought promotes invasive species by reducing wildfire severity," the research, led by Sarah Kimball, Ph.D., director of

the Center for Environmental Biology at UCI, sheds light on the critical interplay of these factors and their profound implications for ecosystem health.

The research, conducted at the Loma Ridge Global Change Experiment, showcases how prolonged drought acts as a catalyst, influencing not only the severity of wildfires but also paving the way for invasive species to take center stage. By simulating drought conditions, the study clarifies connections between climate change, wildfire dynamics, and shifts in plant communities.

Reduced fire severity associated with drought creates an environment conducive to invasive species. Non-native grasses, in particular, thrive in these conditions, potentially leading to a transformation of the landscape and the abundance and diversity of native species.

The findings carry significant implications for managing these vulnerable ecosystems. The study advocates for strategies that carefully consider the frequency of wildfires and the control of invasive species post-fire. Controlled burns, commonly used in other ecosystems, are not recommended for coastal sage scrub systems, as they can inadvertently promote invasive species.

Kimball, the paper's corresponding author, emphasizes the importance of experimental work in unraveling the dynamics between drought, wildfires, and invasive species. "This study is unique in that replicate experimental plots were subjected to several years of different precipitation regimes prior to the wildfire, allowing an opportunity to test how a range of pre-fire weather conditions influenced fire severity and resulting plant community composition," she said.

Kimball adds, "We found feedback between invasive species and low-severity wildfire, indicating that control burns should not be conducted

in this system."

Beyond academic circles, the research holds significance for the public. As wildfires increasingly impact communities, comprehending the factors influencing their severity becomes paramount. The study prompts a reevaluation of traditional wildfire management approaches, highlighting the urgent need to address climate change for the preservation of natural ecosystems.

More information: Sarah Kimball et al, Long-term drought promotes invasive species by reducing wildfire severity, *Ecology* (2024). DOI: 10.1002/ecy.4265

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