Operationalizing the Resist-Accept-Direct framework in the Greater Yellowstone Ecosystem: mapping wildfire, forest, and ecosystem service priorities in a changing climate

Background/Questions

Climate change is causing rapid and irreversible ecological transformations, where ecosystem composition, structure, and functioning change dramatically in response to changing environmental conditions. In the Greater Yellowstone Ecosystem (GYE), and throughout the western US, climate change is increasing the size and frequency of high-severity wildfires. Wildfire impacts in the GYE span multiple management units and therefore multiple mandates and objectives (e.g. species conservation, aesthetic and cultural values, timber production, water and air quality). For example, shifting fire regimes are triggering ecological transformations between vegetation types in the GYE's montane and subalpine forests, impacting management objectives for species, habitats, and ecosystem services. Decisions about how to adapt wildfire management under climate change will impact the likelihood of ecological transformations, with consequences for diverse socio-environmental management objectives.

The Resist-Accept-Direct (RAD) framework can help managers navigate trade-offs between management objectives posed by potential ecological transformations. Decision-makers can use RAD to integrate climate adaptation into the management of wildfires, comparing alternative desired futures and actions that reduce the likelihood of large, high-severity fires (resist), allow fires to trigger vegetation changes (accept), or facilitate recovery of post-fire ecosystems that meet management goals (direct).

Operationalizing the RAD framework across jurisdictions requires accounting for multiple agencies' mandates and goals while fostering inclusion and social legitimacy. Because RAD has not yet been operationalized at a landscape scale across diverse management agencies and jurisdictions, decision-makers face both practical and conceptual barriers to implementing RAD for climate-adapted wildfire management in the GYE.

Methods

To operationalize RAD, we must address the challenge of coordinating wildfire management goals, climate adaptation strategies, and desired futures for forest ecosystems across management agencies. To achieve this, we first need to know the wildfire, forest, and ecosystem service priorities and desired future states across different GYE agencies and to determine where and how these priorities align across the landscape. Working with partners with the National Park Service, US Forest Service, and the Greater Yellowstone Coordinating Committee, we are implementing a photovoice activity and conducting semi-structured interviews with fire, vegetation, and resource managers in various GYE management units to identify shared and diverging strategies and goals for managing wildfires and associated ecological transformations across the GYE.

Results/Conclusions

Through these participatory and collaborative processes, we identify and map 1) agencies' management goals and how they relate to wildfires, climate change, and ecological transformations in forest ecosystems; 2) strategies to coordinate responses to post-fire ecological transformations across units; and 3) the future of fire management in the GYE. Our results highlight both overlapping and conflicting goals, and differences in desired future states across participants, which points to the need for coordination and communication.

We will present preliminary results from our photovoice activity and semi-structured interviews, setting the stage for integrating wildfire management options into the RAD framework to guide managers seeking to incorporate climate adaptation into the management of wildfires and to adapt planning for post-fire ecological transformations.

Suggested session topics:

1. Wildland Fire, Drought, and Climate Change Adaptation
2. Partnerships to Achieve Transboundary Goals
3. Boundaries: Political, Ecological, Economic, & Cultural Dimensions of Decision Making