

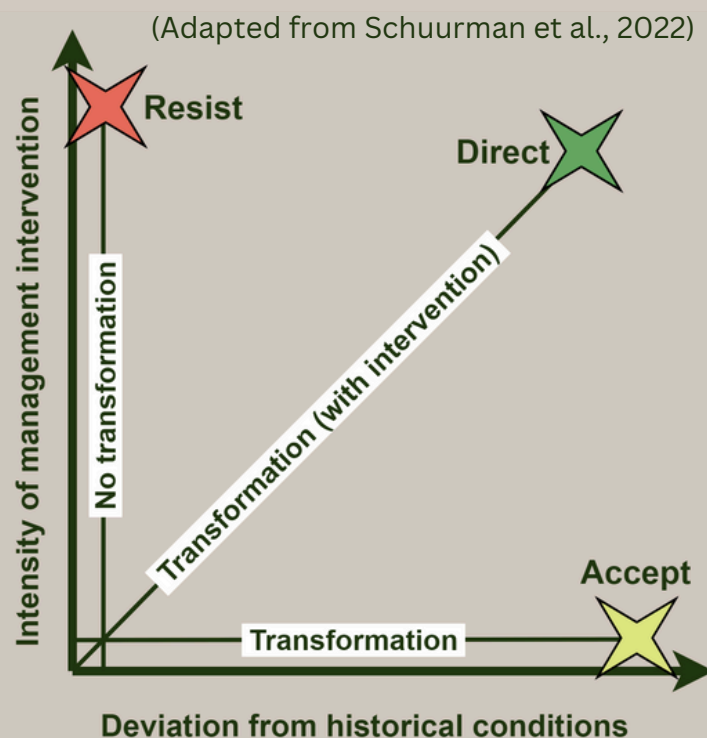
Management Challenge: The RAD Framework to Address Ecological Transformation

Summary: Ecological transformations are persistent shifts in multiple components of an ecosystem that are not easily reversed. They can be caused by many different drivers including wildfire, climate change, and invasive species, as well as interactions between these drivers. For example, increased wildfire and drought frequency and/or severity in sagebrush ecosystems promote the spread of invasive grasses and the transformation to grass-dominated ecosystems. With ecological transformation, it is becoming increasingly hard to maintain ecosystem conditions based on historical baselines. The RAD (resist, accept, direct) framework offers alternative management approaches in addition to those aimed at maintaining historical conditions, including accepting ecosystem transformations or directing systems towards novel conditions (Lynch et al. 2021; Schuurman et al. 2022) .



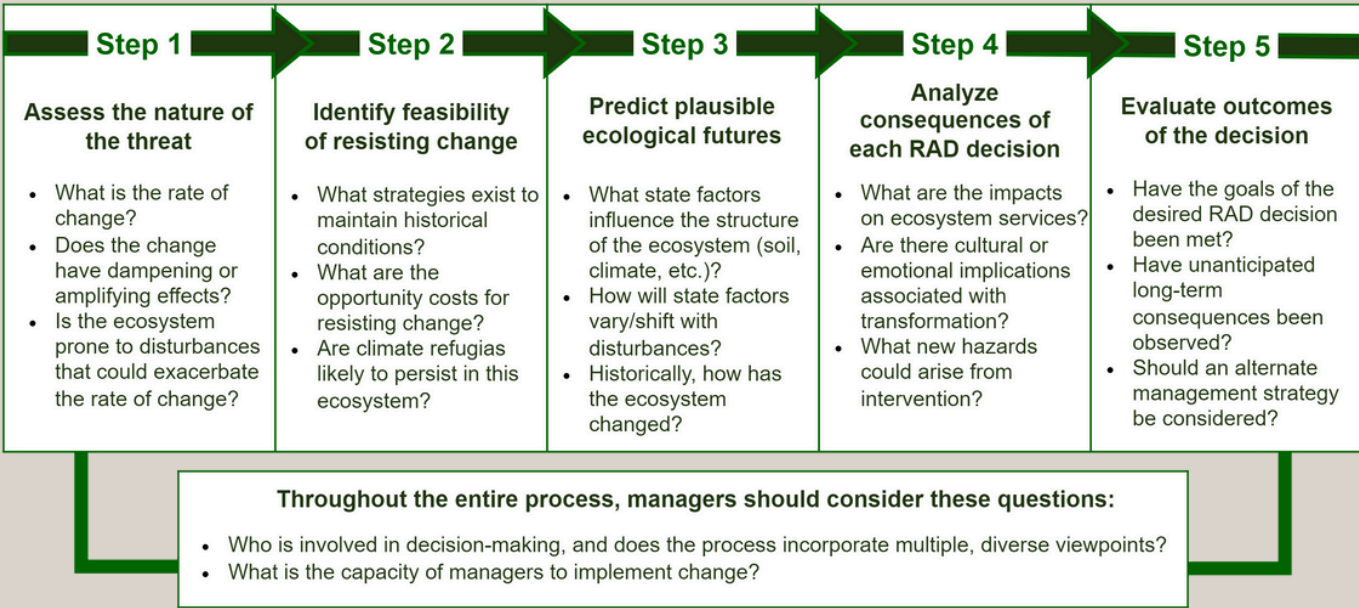
Cheatgrass invasion causing ecological transformation in Southern Wyoming (photograph credit: WyoFile)

The RAD Framework



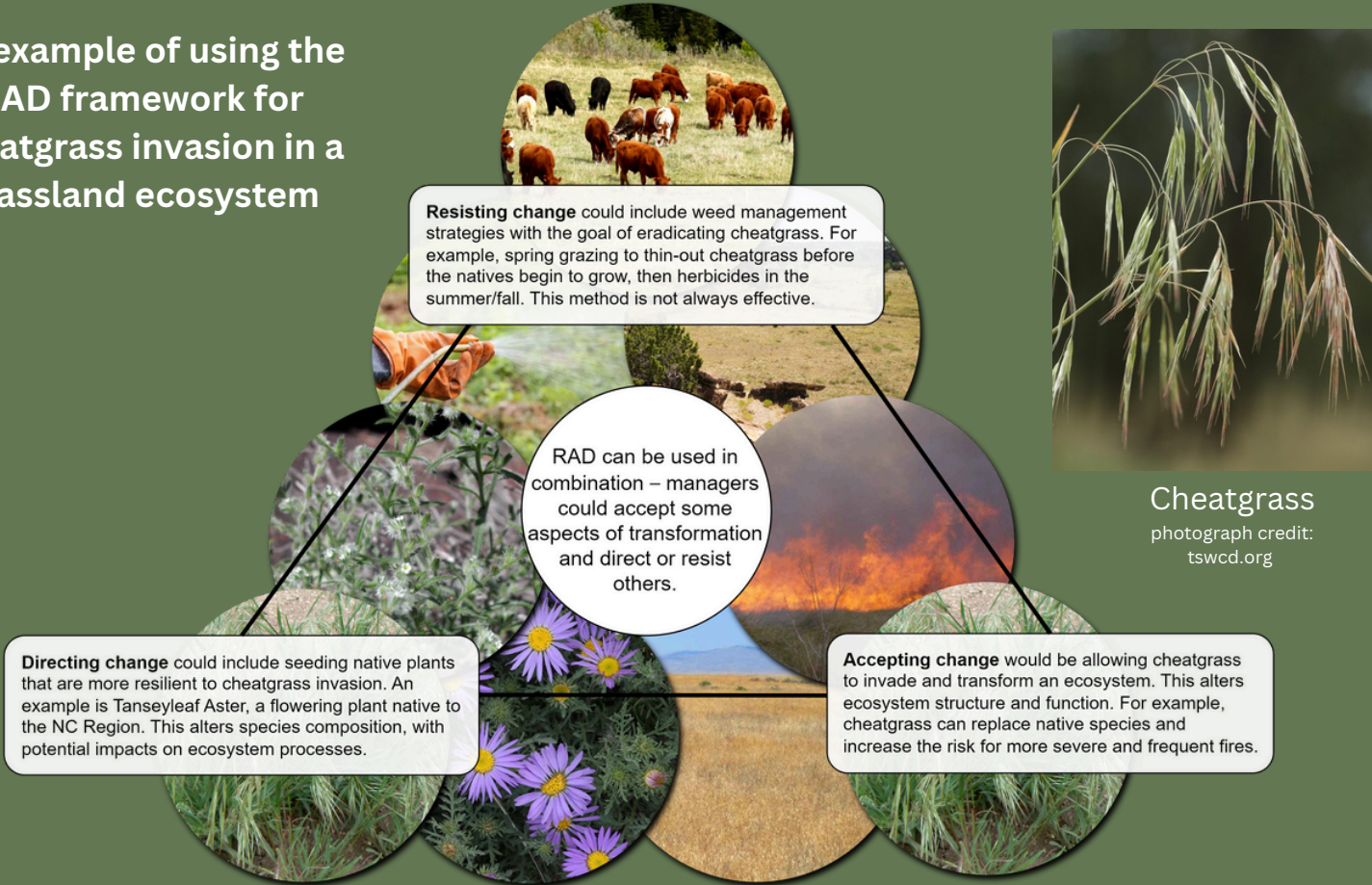
For more information, check out the RAD websites by USGS and National Park Service: [RAD – USGS](#); [RAD – NPS](#)

Once an ecological transformation is identified as a potential threat, how do managers decide whether to resist, accept, or direct the change?



(Adapted from Crausbay et al., 2022; Magness et al., 2022)

An example of using the RAD framework for cheatgrass invasion in a grassland ecosystem



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