

Climate change adaptation “gone wrong” is about much more than climate  
*Kieran Findlater, Shannon Hagerman, Robert Kozak, Veronika Gukova*

Climate change is increasing average temperatures, changing rainfall patterns and making extreme weather events like floods and droughts more common. As temperatures rise, the distributions of some tree species will shift northward and upward in elevation, but many species are not able to move fast enough to keep pace. Scientists have therefore recommended changing how we manage forests to ensure that trees planted after commercial harvest or wildfire are well suited to the climates where they will do most of their growing in the decades to come. The proposed technique, called genomics-based assisted migration (AM), matches the genetic information of individual trees to future conditions predicted by global climate models. This is an adaptation to climate change that would help maintain forest health and productivity, but such adaptations can also have unexpected and unwanted side effects, especially in complex ecosystems like forests. Scientists refer to this adaptation-gone-wrong as ‘maladaptation’, but tend only to consider effects directly related to climate change.

In this paper, we argue that this narrow understanding of maladaptation is harmful because it may overlook the more fundamental reasons that we adapt to climate change: to protect our food supplies, water sources, jobs, homes, wildlife and many other things we value that are threatened by rising heat, storms, wildfires and a range of other impacts. Genomics-based AM could, for instance, encourage overreliance on a small set of commercially-valuable tree species because scientists have only developed the expensive and necessary models for those trees; in turn, this could reduce the diversity of our forests and threaten the birds, animals and other organisms that currently depend on other tree species. We suggest that maladaptation should be defined more broadly: adaptations that threaten those fundamental values. Only by seeing the bigger picture can we avoid creating new problems as we seek to

repair the damage caused by climate change.

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