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already monitored plant responses to recent climate change that include (1) colonization, as altitudinal and latitudinal displacements occur (Parmesan and Yohe, 2003) and (2) adaptation, such as spring-time advances in phenological processes (Hughes, 2000). Currently, mortality through increased attacks by pests and diseases following drought stress is putting some ecosystems at risk (Woods et al., 2005; Hicke et al., 2006). Because of the anticipated rates of climate change, population re-locations through dispersal and colonization are expected to first is through environmentally-induced epigenetic change and the second is through stochastic epimutations (Verhoeven and Preite, 2014).

Environmentally-induced epigenetic changes are direct responses to environmental stresses that are heritable across generations and distinct from common environmental effects such as on gametes or seeds subject to the same environment as the parent. Such effects have been shown for salt-stressed invasive knotweeds (Richards et al., 2008), environmentally-stressed dandelions (Verhoeven et al., 2010) and pathogen-infected Arabidopsis (Dowen et al., 2012). Because these epigenetic responses to select for stress-tolerant genotypes are unlikely to be rapid enough to protect populations against extinction in the face of extreme stresses. However, the potential for epigenetic responses to stress may provide the phenotypic variation necessary to sustain populations during events that could push plants past threshold tolerance levels. We now

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