Science questions for implementing climate refugia for salmon as a conservation strategy

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The recognition and protection of climate refugia has been proposed as a potential adaptation strategy that may be useful for protecting the biotic integrity of watersheds under a changing climate. Climate refugia are areas that are buffered from climate change effects relative to other areas so as to favor greater persistence of valued social, physical, and ecological resources. Paleo-ecological evidence suggests that refugia allowed species to persist through prior periods of climate change, even as surrounding regions became unsuitable. Now managers are asking how refugia might help species persist under future climates. The potential effectiveness of climate refugia as a climate adaptation strategy has several critical uncertainties, including: What physical processes create and maintain refugia? How are these projected to change given climate projections? At what spatial scales must these drivers be considered to maintain species within refugia? Given that paleo-refugia functioned in the absence of a significant human footprint, how will climate change and other anthropogenic stressors interact to constrain refugia effectiveness in the future? In addition to these key uncertainties, other questions remain as to how the concept of climate refugia might be effectively implemented: Are current data (including national aquatic assessments) sufficient to help inform the identification of potential refugia? Are current best-condition 'reference sites' at risk from climate change, limiting their potential utility as refugia sentinels and endangering future detection of status and trends? What are implications for developing water quality criteria and standards? In this presentation and discussion to follow, we will present these questions and explore options for effective research on the potential application of climate refugia as an adaptation strategy.