

California DFG Climate Change Research Needs February 2012

Below is a list of general research needs related to the DFG's climate change adaptation activities and priorities. For more detailed information, please visit the 'DFG climate change related research' document on our website at http://www.dfg.ca.gov/Climate_and_Energy/Climate_Change/Activities/.

Ecosystem Resilience, Restoration, and Adaptation; Decision support tools to help determine when and where to implement adaptation/restoration activities and the best approaches to take. Additionally, tools are needed that guide assimilation of information from climate change research (e.g. projected changes in species and community composition) into various planning applications.

- Methodology/guidelines for assimilating knowledge gained from vulnerability assessments into management plans and adaptation planning
- Assessment of the economic and cultural value of ecosystem services in California and how they may be impacted/threatened by climate change

Baseline data/Mapping; Baseline data is needed as a foundational benchmark to measure changes due to climate change. This information is also necessary for many projection modeling exercises.

- State-wide vegetation maps (underway but in need of additional funding)
- High resolution California species range maps (underway but in need of additional funding)
- State-wide habitat maps

Disturbances/Stressors; Effects of climate change on disturbance agents (e.g. fire, flooding, droughts, insects, invasive species, etc.), the interactions between them, and the resulting impacts to ecosystem function, resilience, and ecosystem services.

- Impacts of increased risk of more frequent and intense wildfire on sensitive species and resulting ecosystem conversions
- Research on the impacts of increased risk of repeated drought/flooding cycles on water quality, quantity, and availability, to minimize conflicts between people and wildlife
- Predictive modeling and integration of climate change scenarios into invasive species management to support early detection rapid response

Connectivity; Information regarding climate change impacts to habitat connectivity and corridor use by wildlife is needed for integration into land use planning and management.

- Additional finer-scale corridor analyses that build off the state-wide Essential Habitat Connectivity Plan and can be utilized in the context of future public land acquisitions and investments

Sea-level rise/Ocean acidification; Research on the impacts of ocean acidification and sea-level rise on marine ecosystems/species, commercial fishing, inundation and increased salinity of wetlands, and contamination of freshwater resources is needed to support coastal vulnerability assessments and the development of appropriate adaptation strategies.

Monitoring; Monitoring changes in ecosystems and key focal species populations over time in association with climate change will be necessary for effective adaptive management.

- Assessment of species tolerances and abilities to adjust or adapt to short term and long term habitat changes caused by climate change