

Steelhead and rainbow trout comprise one species, *Oncorhynchus mykiss*. Steelhead trout are anadromous *O. mykiss* that migrate between the ocean and freshwater streams to spawn; rainbow trout remain in their natal freshwater stream for life. In addition, anadromous trout have much higher fecundity than resident rainbow trout. The populations of California's native *O. mykiss* that live in streams connected to the Pacific Ocean are endangered due to habitat loss, drought, and predation by invasive crayfish (*Procambarus clarkii*). The recent historic California drought has decreased the connectivity of the spawning streams to the ocean and has limited the anadromous members' ability to reach spawning grounds. This is exacerbated by reduced reproductive success due to crayfish predation upon eggs and young trout. Recent conservation efforts focus in part on removing crayfish to boost *O. mykiss* survival.

We create a discrete compartmental model of *O. mykiss* life history dynamics in Topanga Creek. We incorporate a model of invasive crayfish trapping and use numerical simulations and sensitivity analysis to investigate which crayfish trapping regimes most benefit *O. mykiss* persistence in Topanga Creek. The model is generalizable to endangered *O. mykiss* populations in other streams. Model results inform invasive crayfish removal efforts and aid *O. mykiss* conservation efforts.