The importance of moisture corridors in the migration and dispersal of *R. draytonii*

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Background

Pond-breeding amphibians have complex life cycles, meaning they have an aquatic larval stage and a terrestrial adult stage. California Red-legged Frogs (*Rana draytonii*) are a highly terrestrially adapted species that has been documented moving between their breeding habitats and residential locations, and has been extirpated from over 70% of its former range. They breed and often reside at aquatic locations, as water availability is an important aspect of their survival. Both adults and metamorphs must traverse the landscape in order to seek out these spatially separated aquatic habitats, and how they go about doing so is crucial to the persistence of the species. Adults migrate to and from breeding habitat, and metamorphs must disperse from the pond over land to locate residential sites.

Methods & Field Site

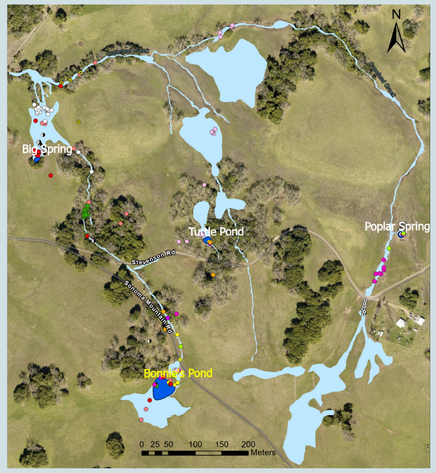
- Frogs were hand captured, weighed, measured, and outfitted with radio transmitters for tracking
- Using radio telemetry, the locations of each frog was determined on average at least once per day
- GPS location was recorded when each frog was found
- Statistical analysis was performed and frog locations mapped with moisture corridors overlayed

Research occurred at Mitsui Ranch located on Sonoma Mountain. Mitsui Ranch is a 632-acre property that contains 2 ponds that CRLF breed in, as well as the headwaters of Copeland Creek.

Research Question

Will migrating/dispersing frogs be found within moisture corridors?

Results



Map 1: locations of all tracked migrating adult *R. draytonii* at Mitsui Ranch

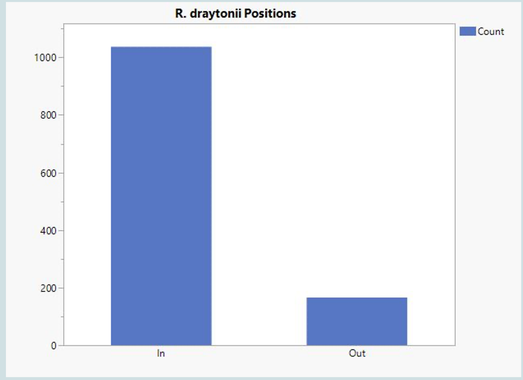
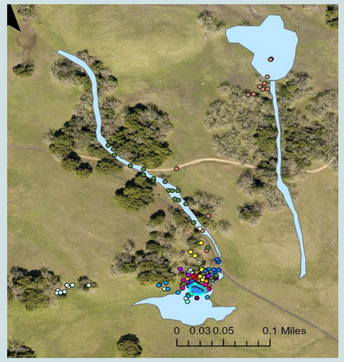


Figure 1: comparison of, migrating *R. draytonii* adults found in and out of moisture corridors

Image 1: Bonnie's Pond; the breeding pond that the adults migrate to and from, and where the metamorphs disperse from

Image 2: radio telemetry using frequency numbers to locate *R. draytonii* adults and metamorphs



Map 2: The colors correspond to a specific frog and each point indicates the frog's location. The dark blue is Bonnie's pond and the light blue is wetland/ephemoral streams

Image 3: Fitting *R. draytonii* with radio transmitters that emit a unique frequency to locate individuals as they migrate/disperse

Discussion

- Through the use of radio telemetry we were able to map the movement patterns of both metamorph and adult *R. draytonii* as they moved away from the breeding pond.
- For adults, movement within moisture corridors such as ephemoral creeks, wetlands and springs was found to be especially important and significant.
- For the metamorph life stage, movement was more randomized with less individuals selecting moisture corridors as their preferred traveling landscape.
- Despite fewer juvenile individuals selecting these wetter areas of the landscape, individuals who travelled further distances than the other froglets who did not, and in some cases had higher rates of survival than their more terrestrial counterparts.
- The results support the hypothesis that moisture is a limiting factor in the survival of both adult and metamorph life stages in *Rana draytonii*.
- Results like these and further future studies can be used to inform policymakers on land-use patterns of the threatened Red-legged Frog, so that better management choices can be made on their behalf.