



Promoting Habitat Connectivity: California Tiger Salamanders and California Red-legged Frogs

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Preview

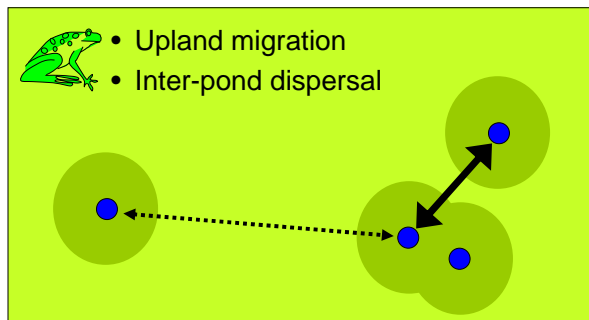
- Species Life History
- Amphibian Movements
- Habitat Requirements/Preferences
- Ideas for Promoting Connectivity
- Local Options

Life History

- | | |
|---|--|
| <ul style="list-style-type: none">• Tiger Salamander<ul style="list-style-type: none">– Breeds in ponds– Larvae aquatic (<1 yr)– Juveniles (2-5 yrs)– Juveniles completely terrestrial– Adults return to ponds only to breed | <ul style="list-style-type: none">• Red-legged Frog<ul style="list-style-type: none">– Breeds in ponds– Larvae aquatic (<1 yr)– Juveniles (~2 yrs)– Juveniles usually near water– Adults usually near water |
|---|--|



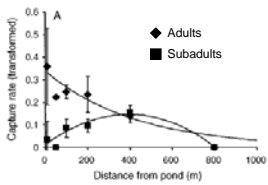
Amphibian Movements



Amphibian Movements

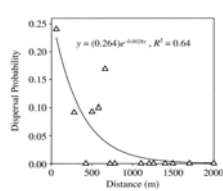
- Tiger salamanders
 - Documented moving 1-2 km into uplands
 - Dispersed between ponds up to 670 m apart

Age Class Density Distributions at Olcott Lake



Trenham and Shaffer 2005 (*Ecol. Appl.*)

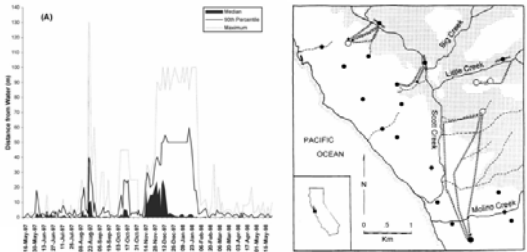
Dispersal versus Distance



Trenham et al. 2001 (*Ecology*)

Amphibian Movements

- Red-legged frog (Bulger et al. *Biol. Cons.* 2003)
 - Most time is spent <100 m from pond
 - Documented migrations >3 km



Habitat Preferences

- | | |
|--|---|
| <ul style="list-style-type: none"> • Tiger salamander <ul style="list-style-type: none"> – Temporary ponds (also permanent ponds) – Grassland and oak woodland uplands – Ground squirrel and gopher burrows | <ul style="list-style-type: none"> • Red-legged frog <ul style="list-style-type: none"> – Permanent ponds without fish or bullfrogs – Springs and seeps (non-breeding habitat) – Burrows and refuges in dense vegetation |
|--|---|

Corridor Considerations

- Corridor width
 - Narrow corridors may be highly lethal
- Pond spacing
 - Increase pond density to maintain connectivity
- Types of ponds
 - Mix of temporary and permanent ponds
- Upland habitats
 - Floodplain habitat may be less suitable
 - Agriculture may be suitable migratory habitat (but consider seasonality of cultivation)

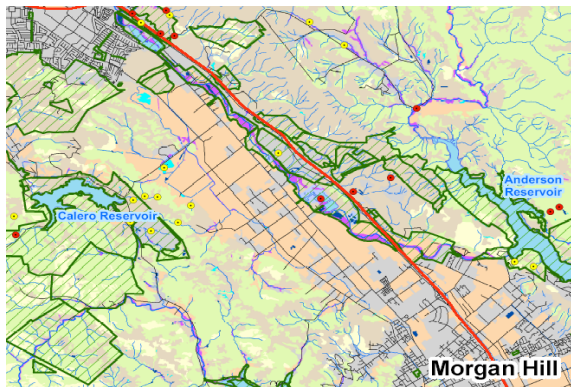
Land Uses

- Conservation land (+)
- Grazing livestock (+)
- Roads (-)
 - Some dispersal across low traffic roads
 - Culverts or overpasses??
- Agriculture (-)
 - Probably not a barrier, but not good upland habitat
- Residential development (-)
 - May provide some suitable upland habitat; potential for mortality
 - Recommend blocking access to residential areas

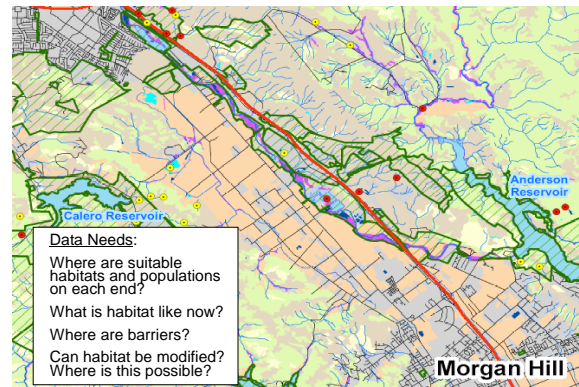
Some Additional Ideas

- Ideally ponds support 'viable' populations
 - But may not be essential for corridor function
- Think of ponds as both breeding habitat and stepping stones for gene flow
 - More productive pools produce more potential dispersers
 - Need to counter-balance mortality in uplands

Corridors in the Real World



Corridors in the Real World



Summary

- A corridor for CTS and/or CRF appears feasible
- Both can move >1km
 - But habitat must be suitable and barrier-free
- Create ponds to increase connectivity
 - Then work on upland habitat quality
- Important for long-term conservation goals
 - Maintaining gene flow and potential for recolonization