Connectivity Strategic Plan Update Meeting, July 1, 2014

SMALL ANIMAL GROUP

Initial species list (from CSP 2011): Orange-throated whiptail, San Diego horned lizard, Dulzura kangaroo rat, California ground squirrel, **San Diego black-tailed jackrabbit, western spadefoot toad**, coastal whiptail, deer mouse, big-eared wood rat, desert woodrat, cactus mouse, **San Diego pocket mouse**, California swollenstinger scorpion, Jerusalem cricket and others   [**bold = MSP species**]

Rationale for monitoring (from CSP 2011):
- Small animal species typically have small home ranges and maintaining viable populations may be achieved in smaller geographic areas.
- Some small animal species may occupy restricted niches (e.g. salamanders, toads, scorpions, etc.) within a larger conserved landscape.
- Intra-core connectivity may be as important as inter-core connectivity for some small animal species.
- In large diverse linkages, some small animal species may utilize the linkages as "live in" or even core habitat and their presence across a linkage may be an indicator that connectivity goals are being partially achieved.
- Research has demonstrated that some small animals may avoid habitat adjacent to roads and other structures.
- Habitat fragmentation and alteration of micro-habitat areas by fire and other activities may profoundly affect maintenance and recovery of small animal biodiversity of core areas.

Approach First Priority Small Animal (SA1) Connectivity Objectives
1. Determine current connectivity for a suite of small animal species sensitive to both inter- and intra-core area habitat fragmentation.

Actions to Achieve Small Animal Priority One Objectives
- Determine which small animal species are most sensitive to habitat fragmentation including fragmentation due to wildfire.
- Determine (1) what type of genetic analysis (mitochondrial, micro satellite, single nucleotide polymorphisms (SNPs) would provide the meaningful data regarding connectivity and (2) which species have appropriate genetic markers already identified.
- Using existing information and the new vegetation map (in prep), identify what portions of selected core areas and linkages are occupied by a suite of small animal species sensitive to habitat fragmentation and already have key genetics issues resolved.
- Analyze genetic material previously collected (or evaluate existing analyzed data) to help inform decisions on appropriate approaches (sampling design, species, etc.) to genetic monitoring of connectivity for small animals.
- Analyze post-fire monitoring data to identify small animal species that are slow to recolonize burned areas, identify potential re-colonization points and methodologies to evaluate potential re-colonization routes/mechanism.
- Identify adaptive management actions that could improve inter- and intra-core area connectivity for the identified species.
- Evaluate monitoring methods that are available, tested, feasible and cost-effective to determine which species will be selected for connectivity monitoring.

Questions for Today 07/01/2014:

1. Are the objectives and actions from CSP 2011 still valid? [no funding previously applied to implement]
2. What species should be the focus of studies? [above list partially based on using past and future pitfall traps to collect animals and genetic samples along a transect that runs from one core, through a linkage, to another core] Other species and questions to consider:
   a. Arroyo toad - how genetically diverse are populations? Are there problem areas?
   b. SD horned lizard at TNERR – reported to be last remaining coastal pop - is it viable or too isolated? Is this a connectivity problem or a native ant problem?
   c. SD black-tailed jackrabbit – is there a patch size issue? Is there a difference genetically between coastal and inland preserves?
   d. Burrowing owl (moved from birds to SA) – are pops in San Diego connected to pops in Mexico and Imperial Co?
   e. Bats – what pops and caves are connected?
   f. Burned areas – how will these areas be recolonized, will some areas/species need assisted re-colonization? Will soil-remediation be needed?
3. Potential Location for studies
   a. Are **big cores** (RJER/SDNWR/Otay Mtn) really connected or do internal roads constitute a barrier for smaller animals?
   b. How important are small fragmented areas [**NoCo coastal, urban canyons**] Is there a minimum patch size needed to maintain pops?
   c. Roads – different sizes and pavement types, what are impacts? Where do small animals cross the **I-15, I-8, SR94, SR67, SR56, Proctor Valley Rd**? How much roadkill is there? What species are getting across successfully? Do roads act as a filter? What are the important characteristics?
      i. Width
      ii. Matrix of lands on either side
      iii. Traffic volume
      iv. Vehicle frequency
      v. Speed
      vi. Fencing and barriers (k rails/jersey barriers)
4. Potential Methods
   a. Genetic studies - considered most important for determining connectedness. What species do we have in the freezer already? Can we detect genetic drift on short timescale? Which species are most sensitive to decrease in connectivity?
   b. Pitfall traps - where are all existing pitfall traps? If examining impact of roads, add traps to either side of roads?
   c. Camera stations? See USGS small animal underpass study.
   d. VES foot surveys

MSP Small Animals with Species-Specific Objectives (=may not want to focus connectivity efforts since likely already included in MSP, but confirm approach with group if time permits)

- Arroyo toad – genetic material to be collected in 2015, should genetic analysis be done similar to SW pond turtle?
- SW pond turtle – should first priority getting new populations established and then work on connectivity up and down watersheds?
- Townsend's Big-Eared Bat
- Pallid Bat
- Burrowing owl - ICR has been collecting genetic samples, should analysis be done to see if a larger effort is justified?