

## **Mohave Ground Squirrel Technical Advisory Group 10 March 2015 – Day 1**

Attendees: Scott Osborn, Phil Leitner, Leo Simone, Don Mitchell, Tonya Moore, Erin Whitfield, Ed LaRue, Glenn Stewart, Jeff Johnson, Stephen Watts, Kim Marsden, Patrick Kelly, Darren Newman, Liana Aker, Shari Heitkotter, Lehong Chow, Kathy Simon, Adam Walters.

Partial List of Web-X Attendees: Becky Jones, Scott Harris, Curt Uptain, Julie Vance, Eric Weiss, Dave Hacker, Lori Bono, Kelly Schmoker, Lisa Gyrner, Margaret Mantor.

### **Reports from the Field**

Patrick Kelly (California State University, Stanislaus) reported trapping 13 grids between Hawaii Reservoir and north of Olancho. He started this effort in spring 2002 (caught 17 MGS on 4 grids), spring 2003 (none), 2004 (3 MGS on 1 grid), 2005 (2 MGS on 1 grid), and 2007 (2 MGS on 1 grid). In 2014 placed 14 cameras on 10 grids, spread out over nine miles, using Leitner and Delaney's methods over a five-day period, re-baiting stations each morning. They did not document any MGS in April 2014, where they also trapped part of Grid 1 with 50-60 traps for three days.

Liana Aker summarized camera studies for spring 2014 at Fort Irwin where they had 10 cameras in the Gary Owen Training Area at an historic site on the base (no observations) north of Nelson Dry Lake, from March through June 2014; and 17 cameras in western expansion area. They had two young MGS of the year on cameras and two MGS observed by staff, for a total of four observations in the western expansion area. They took some of the cameras out because the baits were attracting too many ravens. They put out two new transects last week, eight cameras each, in tortoise conservation areas. Also have a few project areas that will be trapped by contractors. Biologists are currently collecting raven pellets in tortoise critical habitat, and there may be some value in seeing if squirrel parts are in pellets. It would be difficult to differentiate MGS from RTGS, except for those to the far west. Boarman has reported squirrel remains in raven pellets, but still not sure about absolute identifications.

### **Paid and Volunteer Efforts this year**

Ed LaRue indicated he was planning to trap up to three new L.A. County Parks including Mescal, Theodore Payne, and Alpine Butte. He is also considering a few BLM parcels east of there, also in L.A. County. Much of eastern L.A. County is private land that would be attractive for compensation if it can be determined that MGS are present. He also plans to trap out in the Hinkley area during other monitoring efforts, and may implement an incidental take permit at Lynx Cat Mountain. Jeff Johnson will be trapping along Highway 138 but is not expecting MGS. Phil Leitner has been funded by CDFW to perform trapping at Coso in late March and early April 2015. Leitner and Delaney will also be camera trapping north of Harper Lake, which would be funded by one of the nonprofit mitigation bank groups. Leo Simone may be trapping out near Rosamond, but not confirmed, and is willing to volunteer trap. Shari Heitkotter is planning to look at an effort to look at different methods, including bait tubes, for baiting MGS without attracting ravens. Kim Marsden is Larry LaPre's replacement at the BLM. Tonya Moore and Lehong Chow indicated Ironwood may do a few projects but none finalized. Lehong has agreed to help trap L.A. County Park grid(s). Don Mitchell indicated ECORP is doing a lot of non-MGS work, and may be available for volunteer work later in the season. It would be good to have the consultant working on the Highway 58 widening project to take tissues, assuming MGS trapping will be required for that project.

## **Mohave Ground Squirrel Draft Conservation Strategy**

Margaret Mantor has taken the lead on the conservation strategy. Upper management has given Scott Osborn and Margaret Mantor permission to release the strategy to the TAG. They would like to have the TAG provide comments in the next few weeks if possible, with a public version released in 2016. The main part of the conservation strategy starts on page 78, with an extensive literature review leading up to the strategy. Suggest changing bullets to numbers for easier referencing.

The strategy has five main parts: A) Habitat Protection, B) Conservation Mechanisms and Habitat Management, C) Research Needs, D) Climate Change Impacts, and E) Monitoring and Adaptive Management.

For **Habitat Protection**, there is one goal and three objectives with numerous measures to achieve those objectives. The three objectives are to maintain functional linkages, protect population centers through acquisition, and identify best parcels for acquisition. Phil indicated concern with maintaining connectivity between MGS to the northwest, in the Olancha area, with key centers to the south. The urban portions of Ridgecrest and Inyokern threaten to sever this connector. So, the area west of Highway 395 is very important. Another important connector is between Edwards Air Force Base and Desert Tortoise Research Natural Area (DTRNA), but this is difficult to secure because it is mostly private lands and heavily sheep grazed. In spite of 100 years of sheep grazing, MGS appears to be persisting in even heavily grazed areas.

Everyone should be aware that there is a draft Indian Wells Valley Land Use Management Plan with Kern County that has a final comment date of 6 June 2015 and a public meeting on 9 April 2015 in Ridgecrest (see website: <http://pcd.kerndsa.com/planning/environmental-documents>). It would be important for BLM to emphasize the significance of this area and, in particular, the linkage on public lands. Problem that the east-west strip of private land south of Inyokern and Ridgecrest was not identified as part of the MGS Habitat Management Area in the West Mojave Plan. The TAG is encouraged to help prioritize lands for acquisition. How does the plan address climate change and potential for the range to extend northwards? Some research identified and may be covered by adaptive management.

How do we deal with data gaps? Page 84 lists the data gaps, which are mapped on page 98. One large gap is on China Lake Naval Air Weapons Station (NAWS), within the Mojave B Range, which has not been studied but is not obviously threatened. There are also data gaps on Fort Irwin (would be good to check around Avawatz Mountains to the far northeast), eastern L.A. County (south of Edwards, east to L.A. County line), south of Shadow Mountain Road east of Highway 395 to Adelanto, and south of Adelanto west of Highway 395. Another large data gap is between California City and Highway 14. What about Brisbane Valley (between I-15 and Mojave River).

There needs to be an objective, section, or specific discussion as to how funding would be generated to fill in these data gaps, research, land acquisition, etc. Too often, funding strategies and sources are missing from these sorts of plans. It is very difficult and expensive to fund graduate students to take on many of the research issues. It would be important to list existing sources of funding and brainstorm ideas for new funding sources.

For habitat acquisition (see Objective A3), it would be good if someone (CDFW?) could serve to coordinate land acquisition. Currently, Desert Tortoise Preserve Committee (DTPC), Mojave Desert Land Trust (MDLT), and Transitions Habitat Conservancy are all nonprofits that are actively acquiring compensation lands to offset development impacts. Still, there is no one entity coordinating habitat acquisition. It may be appropriate to talk about partnership opportunities with existing and future nonprofit groups. Also, be sure that the management of lands is targeted through endowment and enhancement funds and fees (may be covered in Section B).

For **Conservation Mechanisms and Habitat Management**, there are two goals, one with four objectives and the other with three objectives. Objectives include standardizing conservation methods, develop management prescriptions and protective measures, education and outreach, and development zones, etc. Points include developing Best Management Practices (BMPs), survey protocols, and determining disturbance caps. There have been instances where other CEQA jurisdictions like counties are requiring preconstruction surveys or clearance surveys to remove MGS from the impact area (discussion tabled until tomorrow).

There is the question of identifying those areas where development should be directed, where construction would be encouraged. Who would do this? All of these issues involve coordination among many different agencies. Under B.1.3.1, it would be appropriate to develop an educational film for construction workers, such as was developed by Edwards in about 1992.

For **Research Needs**, there are the data gaps already discussed above. There are two goals and multiple objectives. There needs to be a formalized way or system to submit tissue samples, and a program in place to receive and assess those tissues. As per C.1.1, Phil introduced the concept of sampling the Coso-Olanca population and other core/key areas (Little Dixie Wash, Coolgardie-Mesa (including western expansion area), and Edwards Air Force Base). It is important to cooperate with Department of Defense. Methods should include proximate weather stations, vegetation studies characterizing the sites, and other specific methods.

Currently Marjorie Matocq is the point person for assessing tissue (funded by PG&E), but this needs to be modified as her funding sources change. CDFW has a lab to which samples can be sent, and there is a form to be completed with each submission. The transition has not been made to begin to provide tissues to a new lab, but should be a priority, which would come under the title, "Landscape Scale Genetics." It may also be important to focus genetics studies of squirrels north and south of Ridgecrest. Matocq has indicated that feces can be analyzed to determine what animals are eating, which is particularly lacking for RTGS, and may need to be added to Section C.2.1.1.

Under C.2.1.2, should consider defining the area in question: Per key/core area or range wide? Not likely to perform this as a range wide estimate. It is important to keep track of ongoing survey results, both positive and negative. Phil submitted a paper to Western Wildlife up through 2012, but these results need to be updated on an annual basis. Phil suggested eliminating the final bullet, which suggests necropsies to determine mortality factors. Trapping protocol does not currently require any health assessments of captured animals.

Also under C.2.1.2, ten years ago, telemetry used 5g radios, hardware was lost, batteries needed to be changed annually, etc. It would be best to fit MGS with technologies that track the animals on a continuous basis. Still requires recaptures to change batteries, which usually do not last as long because of continuous feedback. This, in particular, should focus on dispersal abilities and patterns of young MGS.

Objective C.2.2 should not be limited to range shifts or expansions, but also contractions. It may be good to perform exploratory surveys west of Scodie Mountains (LaBerteaux observation at her residence several years ago).

Under Objective C.2.3, each of the studies is driven by identified threats. Although it may be appropriate to prioritize the studies or to tier them, as primary and secondary tiers. It would help if there is some way to estimate (at least relative) costs for each of these studies, which may help determine realistic priorities. One member felt that habitat fragmentation warrants more attention. Fragmentation could be added to Objective C.2.4.1. There is concern that there would not be much funding, so it would be important to identify two or three primary studies.

For **Climate Change**, it may be appropriate to incorporate/add remote sensing to look at changes in habitat with regards to range extensions and reductions. With regards to Measure D.1.1, the USGW model did not look at vegetation, so it would be interesting to model effects on vegetation. Cam Barrows considered vegetation in his models in Joshua Tree National Park. A model was recently completed at Fort Irwin that may soon be helpful.

With regards to Objective D.2, there is no particular reason for using “at least” in front of acreages associated with the Owens Valley and Little Dixie Wash areas; e.g., there is no minimum habitat size analysis that requires this language. These may be more of an indicator of the sizes of available habitats in these two regions. A “sensitivity analysis” should be conducted for these types of models. Measure D.2.2 presupposes that MGS may need more shade, but we don’t know this for sure; forage species are likely more important than shade density. There’s also a naïve assumption that populations will move “upwards” with warmer climates, so it’s important to establish study plots that test the assumptions of models and are sensitive enough to detect changes.

For **Monitoring and Adaptive Management**, there may need to be “trigger mechanisms” in place that would identify when a particular measure would need to be implemented. These proposals all assume there is a baseline to which changes can be compared, yet the word “baseline” is missing from this discussion.

With regards to Goal E.3, it is important to consider translocation success where animals are displaced from impact areas. For example, what is the minimum distance MGS need to be moved to prevent them from returning to the impact area? Also, fences are not likely to exclude displaced animals from returning to the site (sheet metal works but is often cost prohibitive). Most people don’t think captive propagation has a future. Translocation should be added to the list of potential research projects listed in Measure C.2.4.

**Mohave Ground Squirrel Technical Advisory Group**  
**11 March 2015 – Day 2**

Attendees: Scott Osborn, Phil Leitner, Leo Simone, Don Mitchell, Erin Whitfield, Ed LaRue, Stephen Watts, Shari Heitkotter, Lehong Chow, Kathy Simon, Liana Aker, Adam Walters.

Partial List of Web-X Attendees: Becky Jones, Jeff Johnson, Scott Harris, Curt Uptain, Julie Vance, Eric Weiss, Dave Hacker, Lori Bono, Kelly Schmoker, Lisa Gyrner, Margaret Mantor, Bronwyn Hogan, Kim Marsden, Amy Fesnock, Tonya Moore.

**Desert Renewable Energy Conservation Plan (DRECP)**

Bronwyn Hogan with USFWS, previously with CDFW, is working on DRECP. Yesterday's announcement is that the DRECP will be phased to serve as a BLM Land Use Management Plan (LUPA) initially with private take permitting coming in later, as the affected counties determine if or how they may participate. Most counties have asked that the DRECP incorporate their General Plan renewable energy components. Agencies received approximately 12,000 comment letters between September 2014 and February 2015. The Record of Decision for the LUPA portion of the DRECP is expected to be issued by about December 2015. The MGS TAG formally decided to not submit comments, although several individuals did provide comments.

The agencies are currently assessing the action alternatives to assure they are sufficient to cover the LUPA-only alternative. Since both public and private lands would have accommodated 20,000 MW, there will likely be a reduced targeted number on public lands, only. Amy Fesnock indicated BLM does not know what percentage of original Development Focused Areas (DFAs) still need to occur on BLM lands. Bronwyn was not sure how the new approach would affect DFA acreages; whether they would be enlarged on public lands is unknown. There is concern that there was a balance between DFAs and conservation areas in the Draft EIR/EIS, and how that balance may be affected by eliminating private lands from considerations. Amy indicated that BLM is committed to the conservation areas that were identified in the draft, so there may be an imbalance, but it would be in favor of conservation.

At this time, there is no mandated opportunity for new public comment until the Final EIR/EIS is released. Phil stated that the West Mojave Plan (No Action Alternative) already does a pretty good job with its MGS Habitat Management Areas, and the preferred alternative under the Draft EIR/EIS DRECP seems to make more MGS habitat available for renewable energy development. Although the public comment period has ended, Bronwyn indicated that concerned individuals are encouraged to continue to submit comments.

**Leitner/Delaney 2014 Camera Trapping Study**

The 2014 study occurred west of California City, north of Edwards, and east on Mojave in one of the data gap areas and also targeted for renewable energy on private land where eight stations were established, one in March and a one in May. Placed cameras on BLM lands in this area in 2011 but no MGS; did find MGS around DTRNA. Historic occurrences are shown in Figure 4 in their 2015 report. The red-dashed line shown in Figure 6 of the 2015 report may indicate that MGS has been extirpated west of this line. Areas west of Highway 14 in higher elevation areas

may accommodate MGS responding to climate change. Dave Hacker indicated there is insufficient data to say that this is not MGS habitat, that the range should be truncated to the east of the current range line.

### **Camera Trapping as Part of MGS Survey Protocol**

Scott Osborn is soliciting input on adding camera trapping to the existing live-trap protocol. He would really like to see a study performed that looks at the efficacy of camera trapping compared to live trapping. Given financial and other limitations, it is not likely that such a study could be implemented in the near future. This would likely be a combination of the two methods and a statistical treatment of the results to see which is more efficacious. Scott noted that a variable approach to trapping should be added as a research topic in the Draft Conservation Strategy discussed yesterday. Also appropriate to reconsider the current trapping protocol and have it considered and commented on in a future MGS TAG meeting.

Cost of camera trapping is reduced, in part, because no heightened skill level is required to go through thousands of photographs; there's no need to disable cameras in hot weather; it eliminates the possibility of losing animals in traps. The bait stations may attract ravens, coyotes, and kit foxes but there is no documented evidence that any of these predators are taking squirrels at bait stations. There are photographs of kangaroo rats being taken by kit foxes. Cannot collect genetics data with cameras, determine reproductive status, health of animals, which are some limitations.

There are a range of options, which could include live trapping with supplemental camera traps. There has been a recent trend with larger areas being developed, so it is usually cost prohibitive to trap a 3,000-acre site (at 80 acres per grid), for example. A protocol needs to be developed to determine the best way to use cameras, and to interpret results. For example, if only 1 of 100 cameras detects MGS, is the entire 6,000-acre site to be considered occupied? At this point, we don't even know how effective traps are; what percent of MGS present are being trapped; or how often are MGS present that are not being captured? Also need to determine the appropriate hardware for camera trapping, particularly since they are vulnerable to theft. Higher resolution cameras are likely necessary when you need to differentiate between MGS and RTGS.

With regards to hybrids between MGS and RTGS, it would be possible to say that no camera trapping should occur between Barstow and Kramer Junction, for example. For larger jobs, could use camera traps to identify where MGS/RTGS occur, the live trap to determine genetics. There is also the question of how CDFW would (or would not) require incidental take permits for hybrids.

### **Burrow Excavation as an Impact Minimization Measure**

The memo produced by Phil and Ed LaRue in December 2014 was distributed. Ed provided background information citing project proponents that are requiring identification and avoidance of MGS burrows, CDFW's requirement where an incidental take permit was required where rodent burrows were found, and clearance surveys are now being required in the vicinity of MGS burrows. CDFW cannot require that all non-Covered Species be recorded, although it has some

merit. There needs to be an expanded discussion to determine minimization measures such as clearance surveys, translocation methods, etc. Scott has a list of such measures and will distribute them to TAG members. Julie Vance indicated that burrows surveys should not be required. Dave Hacker indicated that CDFW wants biologists to excavate obvious MGS burrows (like when a MGS enters the burrow), but there has been no requirement to excavate every rodent burrow within a right of way. There needs to be better language in the incidental take permits to clarify this issue.

There was some discussion about MGS detection using dogs (Bill Vanherweg has done some of this), with both pros and cons identified. This topic needs more research. Phil indicated trained dogs would be an ideal way to perform clearance surveys. Becky Jones reported that dogs were good at finding MGS in burrows within the expansion area.

### **Geographic Range Boundary Revisions** (Scott will distribute Phil's maps to TAG members)

Main question: Do we know enough to change the 1993 range line? There was a MGS road kill just south of Highway 190 in Panamint Valley. The only two possible range extensions may be north into Panamint Valley and west towards Weldon, near Lake Isabella. It may be that the prolonged drought from 1989 to 1990 resulted in widespread extirpations with no subsequent recruitment.

Phil's last map shows substantial truncations to the southwest, south, southeast (relict "population" in the Adelanto area), and eastern part of Fort Irwin. So, should a new range line be adopted, and what are the ramifications? These areas may not be currently occupied but do represent the historic range. Much of this area is inside city limits and in urbanizing portions of unincorporated counties. There are many risks in drawing lines that would officially truncate the historic range.

If this line was adopted, would trapping still be required outside that line? CDFW would not likely be able to require surveys, or it would at least be more difficult to justify them. Dave Hacker indicated that a more reasonable approach may be to draw the line between the historic range line and Phil's red line, which represents the most liberal truncation based on trapping results in the past 10 years (this particular map will not be distributed). Dave Hacker reiterated his concern about retracting the range west of California City, which would exclude the Hyundai record in 2002.

Liana indicated that they trapped more than 900 camera trap days and detected their two MGS during the last 70 days, so there is the potential to miss animals that are there. Maps should not only show locations but longevity of each effort. Tony Recht would catch MGS 10 days into trapping a given grid at Fort Irwin.

### **Research and Monitoring Priorities**

Kim Marsden indicated that BLM has asked for \$100,000 to perform surveys for MGS in 2016 on five sites between Barstow and Ridgecrest, but this has not been approved. This would

provide for the first year effort to provide for long-term monitoring to gauge the effects of climate change.

Phil made a list of suggested research projects that he presented to the TAG at the November 2014 meeting. We should look at the research identified in the Draft Conservation Strategy and Phil's to be sure there is a comprehensive list. Phil's list included 1) monitor important populations, 2) monitor trends, 3) investigate MGS and RTGS interactions, 4) MGS occurrence in data gap areas, 5) important acquisition areas, and 6) potential changes in shrub communities. The time frame for these would be the next six years, including this one. Edwards would not likely be able to fund any studies over the next few years, but would be receptive to allowing researchers to work there with their own funding.

With regards to 1) monitor populations and 2) monitoring trends, Phil would like to see repetitive surveys every year for 1) and every five years for 2). Annual surveys for long term trends would be better if there was money, which there isn't. It would be good to talk to scientists who perform occupancy modeling on a regional level to determine what the best repetitive time frame may be.

For 3) interaction between MGS and RTGS, Liana indicated there are studies at the contact zone at Fort Irwin that may lend themselves trapping where observations are made to perform genetics studies. Very few population studies have been completed for RTGS like what they eat, how long they are active, their breeding season, etc.

Dave Hacker believes that range wide occupancy models may be a good way to fill in the data gap areas under 4).

For 5), it is important to identify those private lands most important for acquisition, and that CDFW may be the appropriate entity to take the lead on this and maintain the data base as it is developed. Linkages should be one of the targeted areas.

For 6), Phil trapped 68 different sites between 2002 and 2010 and performed shrub surveys at each of these sites, so there are baseline data. Three of these were on Edwards; they include both negative and positive sites for MGS occurrence. Shrub surveys were also performed at camera sites but were less intensive. The surveys could be repeated to see if there are changes in shrub cover, density, diversity, etc. Liana will provide a soon-to-be-published paper on several hundred long term plant study plots in the West Mojave.

Scott then compared the research list in the Draft Conservation Strategy with Phil's list of six priorities. He ranked research issues in the Draft Strategy that as to low, moderate, and high, which are not reflected in these notes; and also looked to see if any of these research issues were not covered in Phil's list of six priorities. Scott will work with these two lists over the next few weeks.

So, how should Phil's list be prioritized? Land acquisition (5) should be moved to near the top, whereas changes in shrub composition (6) would be left in its place at (or near) the end. Phil will make these data and methodologies available to reproduce the data in the future. Data gap

analysis (4) may be placed even before acquisition to better understand and identify priority acquisition areas. Studying the hybrid issue (3) has important management implications and should be one of the highest priorities. Population monitoring baseline data (1 and 2) are important if the species is ever to be federally listed. In the end, Numbers 1, 3, 4, and 5 were identified as #1 priorities; Number 2 (trends in occupancy) was #2 priority; and shrub cover (Number 6) was identified as a #3 priority.

Phil envisions a three-four year, funded project to study the hybridization issue, which would cost a quarter million dollars a year and \$400,000 to study occupancy trends.

### **Next Meeting**

Late September or early October are suggested dates.