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September 22, 2010

Eric Solorio
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: Mohave Ground Squirrel (MGS) Habitat Connectivity Study – Ridgecrest Solar 1, LLC: AFC - Docket No. 09-AFC-9; BLM ROW -#CACA 49016

Enclosed is the third draft of the proposed MGS Study. The revised draft reflects the comments received at the September 9th workshop in Sacramento on the subject.

Your earliest attention to reviewing the document would be appreciated. We expect at least one more workshop to resolve questions and to finalize the study scope. Comments in advance of another workshop would facilitate a more productive session and scope resolution.

If you have questions, please get in touch.

Sincerely,

Billy Owens
Sr. Director, Project Development

Solar Millennium LLC
A Wholly Owned Subsidiary of Solar Trust of America
1111 Broadway, 5th Floor
Oakland, CA 94607
t. (1) 510.524.4517
f. (1) 510. 463.6475
Info@SolarMillennium.com
http://www.SolarMillennium.com

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
For the *RIDGECREST SOLAR POWER PROJECT*

Docket No. 09-AFC-9

PROOF OF SERVICE
(Revised 7/9/2010)

APPLICANT
Billy Owens
Director, Project Development
Solar Millenium
1625 Shattuck Avenue, Suite 270
Berkeley, CA 94709-1161
owens@solarmillennium.com

Alice Harron
Senior Director, Project Development
1625 Shattuck Avenue, Suite 270
Berkeley, CA 94709-1161
harron@solarmillennium.com

Elizabeth Copley
AECOM Project Manager
2101 Webster Street, Suite 1900
Oakland, CA 94612
elizabeth.copley@aecom.com

***Scott Galati**
Marie Mills
Galati/Blek, LLP
455 Capitol Mall, Suite 350
Sacramento, CA 95814
sgalati@gb-llp.com

Peter Weiner
Matthew Sanders
Paul, Hastings, Janofsky & Walker LLP
55 2nd Street, Suite 2400-3441
San Francisco, CA 94105
peterweiner@paulhastings.com
matthewsanders@paulhastings.com

INTERVENORS
Desert Tortoise Council
Sidney Silliman
1225 Adriana Way
Upland, CA 91784
gssilliman@csupomona.edu

California Unions for Reliable Energy (CURE)
Tanya A. Gulesserian
Elizabeth Klebaner
Marc D. Joseph
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
tgulesserian@adamsbroadwell.com
eklebaner@adamsbroadwell.com

Basin and Range Watch
Laura Cunningham & Kevin Emmerich
P.O. Box 70
Beatty, NV 89003
bluerockiguana@hughes.net

Western Watersheds Project
Michael J. Connor, Ph.D.
California Director
P.O. Box 2364
Reseda, CA 91337-2364
mjconnor@westernwatersheds.org

Kerncrest Audubon Society
Terri Middlemiss & Dan Burnett
P.O. Box 984
Ridgecrest, CA 93556
catbird4@earthlink.net
imdanburnett@verizon.net

Center for Biological Diversity
Ileene Anderson
Public Lands Desert Director
PMB 447, 8033 Sunset Boulevard
Los Angeles, CA 90046
ianderson@biologicaldiversity.org

Center for Biological Diversity
Lisa T. Belenky, Senior Attorney
351 California Street, Suite 600
San Francisco, CA 94104
lbelenky@biologicaldiversity.org

INTERESTED AGENCIES
California ISO
E-mail Preferred
e-recipient@caiso.com

Janet Eubanks, Project Manager,
U.S. Department of the Interior
Bureau of Land Management
California Desert District
22835 Calle San Juan de los Lagos
Moreno Valley, California 92553
janet_Eubanks@ca.blm.gov

Scott O'Niel, Executive Director
Naval Air Warfare Center Weapons Division
1 Administration Circle
China Lake, CA 93555-6100
scott.oneil@navy.mil

Scott O'Niel, Executive Director
Naval Air Warfare Center Weapons Division
575 "I" Avenue, Suite 1
Point Mugu, CA 93042-5049
scott.oneil@navy.mil

ENERGY COMMISSION
JAMES D. BOYD
Vice Chair and Presiding Member
jboyd@energy.state.ca.us

ANTHONY EGGERT
Commissioner and Associate Member
aeggert@energy.state.ca.us

Lorraine White
Advisor to Commissioner Eggert
lwhite@energy.state.ca.us

Kourtney Vaccaro
Hearing Officer
kvaccaro@energy.state.ca.us

Eric Solorio
Project Manager
esolorio@energy.state.ca.us

Tim Olson
Advisor to Commissioner Boyd
tolson@energy.state.ca.us

Jared Babula
Staff Counsel
jbabula@energy.state.ca.us

***Jennifer Jennings**
Public Adviser
E-mail preferred
publicadviser@energy.state.ca.us

DECLARATION OF SERVICE

I, Elizabeth Copley, declare that on September 22, 2010, I served and filed copies of the attached Ridgecrest Solar Power Project (Docket No. 09-AFC-9) Mohave Ground Squirrel (MGS) Habitat Connectivity Study Scope-Third Draft. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:

[http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

X sent electronically to all email addresses on the Proof of Service list;

_ by personal delivery;

X by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

X sending an original paper copy and one electronic copy, mailed and emailed Respectively, to the address below (preferred method);

OR

__ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-9
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Ridgecrest Solar Power Project
Mohave Ground Squirrel Habitat Connectivity Study

Scope of Work Outline—THIRD DRAFT
September 22, 2010

Background and Purpose

On behalf of Solar Millennium, LLC, AECOM, Dr. Philip Leitner, and Dr. Fraser Shilling propose to develop and implement a study of Mohave ground squirrel (MGS, *Xerospermophilus mohavensis*) habitat connectivity near Ridgecrest, CA. The objectives of the study are to determine: (1) spatial patterns of MGS occupancy on and near the proposed Ridgecrest Solar Power Project (RSPP) site; (2) where landscape connections among MGS populations exist in this region, and whether those connections presently function as movement corridors; (3) the relative importance of the existing RSPP site and adjacent landscape to MGS movements and population connectivity; and (4) the degree to which construction of the RSPP would impair connectivity among MGS populations.

Concerns about the effects of the proposed RSPP on MGS habitat connectivity have been raised and discussed during environmental review of the project. However, empirical data to evaluate the existing importance of the site for local and regional MGS movements, dispersal, and population connectivity do not currently exist.

Approach

This study will be a collaborative effort among various government agencies including the California Energy Commission (CEC), California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and Bureau of Land Management (BLM). The work will be performed by experts on MGS biology and wildlife habitat connectivity that are under contract to Solar Millennium LLC. The study is expected to involve MGS trapping, radio telemetry, genetic analysis, and habitat connectivity modeling over two consecutive years. The Gantt schedule for the proposed study is provided at the end of this outline, entitled “Mojave Ground Squirrel Habitat Connectivity Draft Schedule” dated September 17, 2010.

Under the direction of Dr. Leitner, MGS habitat occupancy and connectivity will be assessed by collecting and analyzing a combination of data describing MGS presence, distribution, movements, and genetic relationships. Dr. Leitner will lead field studies over a region extending out at least 5-10 miles from the RSPP site (i.e., study region). Live-trapping of MGS and collecting environmental variables at trapping locations can provide information on the distribution of MGS in the study region and environmental factors that may be associated with MGS occupancy. By the use of radio-telemetry, the studies will provide insight into landscape movement patterns of both adult and juvenile MGS within the study region. Genetic data collected from animals within the study region can be compared with existing genetic data from adjacent MGS populations to evaluate patterns of gene flow among these populations. By integrating these data, it will be possible to assess the relative importance of the RSPP site for connectivity as compared to other areas within this study region. By conducting the study over two years, it will be possible to greatly increase the probability of collecting adequate data given the inter-annual variability in winter rainfall, forage availability, reproductive rates, and juvenile dispersal.

Analytical tools to model habitat connectivity would be identified by Dr. Fraser Shilling who would serve as a scientific advisor on habitat connectivity modeling throughout the study. Dr. Shilling is the co-director of the Road Ecology Center with the Department of Environmental Science and Policy at U.C. Davis where he is the lead investigator for several large projects related to connectivity and wildlife movement in California. In his role as lead investigator, Dr. Shilling regularly assesses and implements appropriate methods for connectivity modeling at local and regional scales using GIS-based approaches and uses wildlife movement tracking and statistical/spatial models to determine to what extent wildlife take advantage of opportunistic landscape connections in disturbed environments.

This scope of work has been revised following initial agency consultation during a CEC workshop on September 9, 2010. The revised scope of work provides a greater level of detail regarding the types of methods that are anticipated to achieve project objectives. Tasks 1-4 describe work that is expected to be conducted during the first year (Phase 1) of the study. Phase 2 of the study, described in Task 5, is expected to include a second year of field sampling, data analysis and connectivity modeling, and report preparation. It is anticipated that the scope of work for this second year of effort - Task 5- may be refined, following an evaluation of data collected during Phase 1.

Task 1. Develop Phase 1 Study Plan

AECOM (in coordination with Dr. Leitner and Dr. Shilling) will develop a study plan that includes a detailed description of work proposed as part of Phase 1 of the study. The study plan will be reviewed, revised by AECOM, and discussed during up to two CEC workshops. AECOM has already participated in one CEC workshop on September 9, 2010. A second CEC workshop under this task is proposed for November 2010. AECOM will request approval of the final study plan by the agencies prior to initiating Task 2.

A primary element of the study plan will be to define the study region, which will include the RSPP site and a region extending out at least 5-10 miles. It will encompass the landscape areas that appear to be important for connectivity between MGS populations. GIS layers representing land ownership and physiographic features will be used to identify appropriate study areas within the larger study region. The placement of study sites (trapping units) within each study area will be identified by a randomized selection process. Environmental and physical attributes that can be used to evaluate habitat suitability at the study sites will be described in the plan.

In the study plan, Dr. Shilling will describe tools that can be used to conduct connectivity analysis, including models and statistical approaches. Three types of modeling will be described: habitat suitability modeling, disturbance modeling, and corridor modeling. Habitat suitability modeling is widely used; it is expected that suitability modeling conducted for this study could be done so that it is compatible with a model currently be developed by CEC. Disturbance modeling uses information about human activities in a raster or grid modeling environment and analyzes these data according to questions driving the analysis and the requirements of the organism or process affected by the disturbance. The disturbance data would include transportation infrastructure; residential, commercial, and industrial development; population density; electrical transmission corridors; and recreation areas and trails. These models are usually best built as custom models to answer questions defined by the project. Corridor modeling uses habitat suitability and disturbance information to approximate how animals would move through a landscape, assuming enough is known about the species' behavior. There is a wide variety of corridor models available: 1) Least cost corridor uses a simulated object moving across a landscape, where each incremental step is toward a lower-cost or more suitable location; 2) Graph theoretic approaches which estimate the relative value of different potential connections among objects (such as population locations, or places on a landscape); 3) FunConn approximates movement of different organisms using information

about the landscape and rules about organismal movement behavior.; and 4) Circuitscape uses electrical circuit theory and habitat/disturbance maps to predict where organismal movement and connections are more and less likely among places on a landscape. Drs. Shilling and Leitner will work together to describe how occupancy, movement, habitat, and genetics data collected during field sampling can be used to inform connectivity analysis and modeling.

Assumptions: Since the proposed study area is almost entirely federal land managed by BLM, it should be possible to obtain access for actions proposed in the study plan.

Deliverables: Draft and final study plan.

Task 2. Prepare for Phase 1 Field Studies and Connectivity Modeling

Following the approval of the study plan and prior to field sampling in early February 2011, Dr. Leitner will finalize the selection of study sites (trapping grids) in each of the study areas, including the number of trapping grids. Dr. Leitner will prepare field maps and conduct up to two field visits to mark and record coordinates of study sites. Field technicians and other personnel will be hired and their qualifications to conduct MGS studies will be confirmed with CDFG. Field equipment and supplies needed for field studies will be acquired during this period to ensure that work can begin on schedule in early February 2011.

For sampling site selection, connectivity modeling, and data analysis, more detailed information is needed about vegetation, natural and artificial disturbance, and geomorphology (e.g., slope). Dr. Shilling will develop a basic analysis of vegetative cover including shrub diversity, shrub canopy cover, and topographic characteristics.

A memo will be submitted to CEC that describes the actions that were taken as part of this task following the approval of the study plan and the upcoming field sampling. The memo, including pertinent maps of trapping grid locations, will be reviewed during a CEC workshop.

Assumptions: Field crew responsible for capturing, marking, and obtaining tissue samples from MGS will be required to obtain permits from CDFG. Most equipment for live-trapping will be provided by Dr. Leitner but radio-telemetry equipment will need to be purchased.

Deliverables: Memo describing actions that were taken following the approval of the study plan and upcoming field sampling.

Task 3. Conduct Phase 1 Field Sampling

Field sampling for MGS under this task will be conducted during 2011. All live-trapping, handling, and radio-collar procedures will follow the guidelines established by the American Society of Mammalogists (Gannon et al. 2007). All personnel capturing, handling, and marking MGS will be approved for these activities by the CDFG. All trapping would occur under the supervision of Dr. Leitner.

Task 3a. Collect data for MGS occupancy in the study region

Conduct live-trapping to assess the occurrence and distribution of MGS in the study region. The trapping effort would attempt to determine if MGS, including resident adults, are present in the proposed RSPP site and adjacent lands. Three trapping periods are proposed, each approximately 6 weeks in length. The first trapping period will be from about Feb. 1-Mar. 15, the second from Mar. 16-Apr. 30, and the third from May 1-June 15. These periods define 3 distinct phases in MGS spatial behavior: mating season when adult males undertake extensive daily movements in search of mates, then the period in which

adult females are pregnant and lactating and movement of both sexes is limited, and finally the period in which juveniles are becoming more mobile, leading in some cases to long-distance (>1 km) dispersal. Captured animals will be marked with PIT tags for population study, demographic data collected (e.g., sex, age, reproductive status), tissue samples taken for genetic analysis, and animals marked with radio tags for study of movements.

Task 3b. Collect environmental data

Environmental data that may be related to MGS habitat suitability will be collected at all trapping sites within the larger study region. These data will help identify habitat characteristics that are correlated with MGS presence. Quantitative data include plant community composition, percent plant cover, soil properties, topographic features, and habitat disturbance factors such as roads, OHV activity, and grazing history.

Task 3c. Gather data for Mohave ground squirrel movement in the study region

Conduct radio-telemetry study of MGS adult males and females and juveniles to assess movement patterns within the proposed RSPP site and the larger study region. By radio-tracking adult males during the breeding season, it will be possible to identify corridors for local gene flow. Radio-tracking adult females will allow identification of natal burrows where juveniles can be captured and radio-collared. This task would attempt to identify potential MGS movement corridors by tracking the movements of juveniles as they disperse to new habitats within the study region. All radio-telemetry would occur under the supervision of Dr. Leitner.

Task 3d. Collect tissue samples for genetic analysis

Tissue samples will be collected from captured MGS. Analysis of genetic information from these samples would utilize microsatellite markers to document genetic diversity of populations, to explore regional gene flow patterns, and to estimate importance of different portions of the study region for connectivity. Genetic information sampled from MGS individuals, and analysis of genetic markers, can provide information on potential MGS movement corridors in the study region.

Task 3e. Prepare memo of field sampling results

Following the first year of sampling (Phase 1), AECOM will prepare a preliminary memo describing field sampling results that would be submitted to the agencies for review and comment. AECOM will organize and participate in a CEC workshop to discuss to the results of field sampling, propose methods for data analysis and modeling, and evaluate the field sampling and modeling approach for Phase 2 beginning in 2012.

Deliverable: Preliminary memo of field sampling results.

Task 4. Analyze Phase 1 Field Data and Conduct Connectivity Modeling

MGS trapping data will be used to estimate percent occupancy and detectability in the various study areas of the study region. Models describing occupancy patterns will be developed and tested using the software package PRESENCE. Environmental variables can be used as covariates in testing hypotheses regarding habitat suitability.

Radio-telemetry data will be mapped to indicate the extent and location of movements within the study region. These data will be used in combination with genetic information to describe the extent to which adult male movements and juvenile dispersal contribute to gene flow within and among MGS populations within the study region.

The suite of connectivity models and statistical analysis tools described in task 1 can be used to compare field data for occupancy and movement (task 3) and to develop an integrated connectivity model that incorporates landscape disturbance, habitat suitability, MGS occupancy and movement, and genetic information. This analysis and modeling approach would be useful for estimating priority areas for occupancy, movement/dispersal, and conservation.

The results of analysis and modeling will be presented at a CEC workshop. AECOM will request concurrence to move forward with Phase 2 of the MGS study which would include field sampling, data analysis and connectivity modeling, and report preparation during 2012.

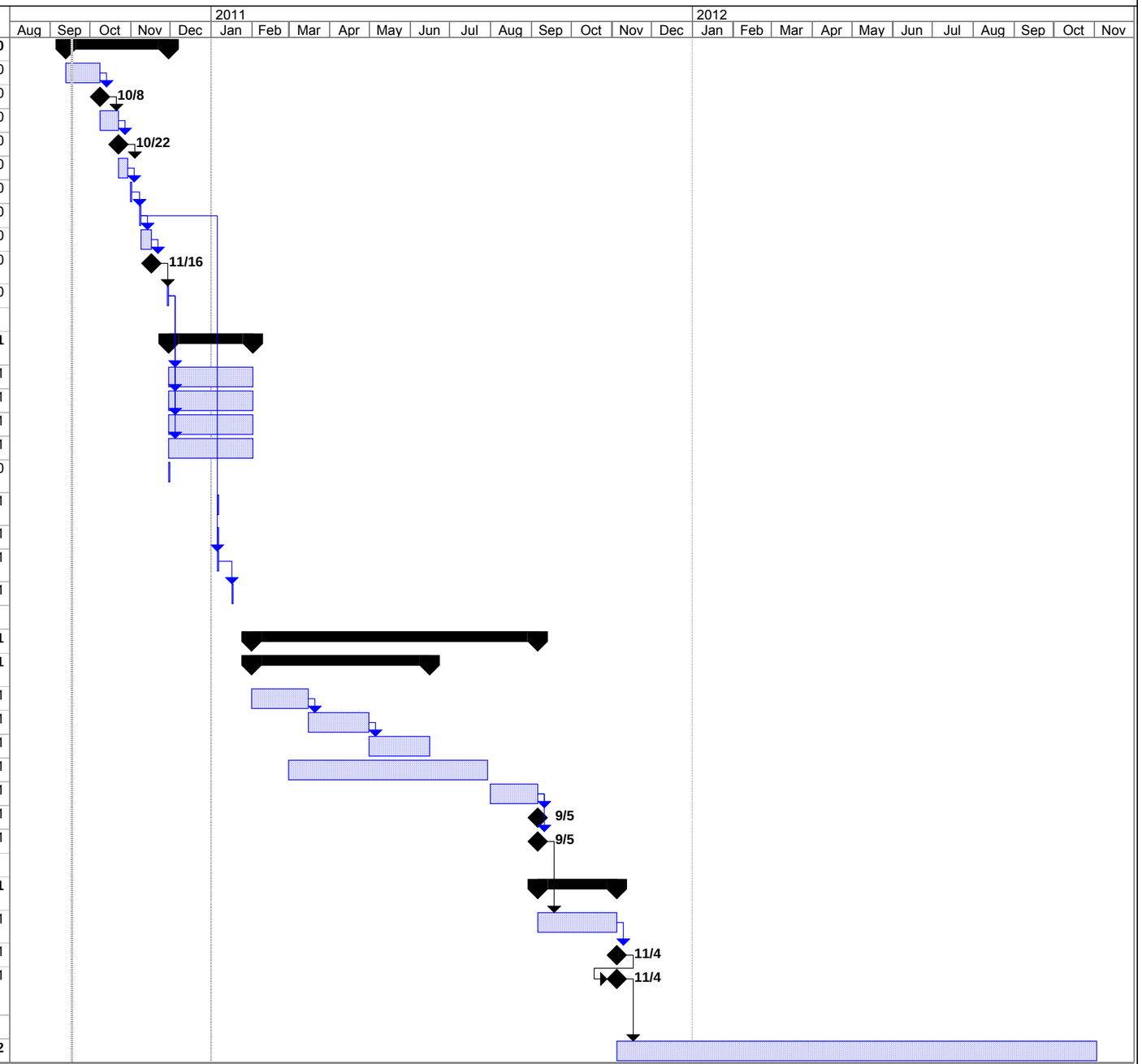
Deliverable: Final Phase 1 report.

Task 5. Phase 2 Field Sampling, Data Analysis and Connectivity Modeling, and Report Preparation

The scope of Task 5 would include Phase 2 field sampling, data analysis and connectivity modeling, and reporting. The specific work completed under this task cannot be described in detail until after agency consultation on Phase 1 results has concluded.

Mohave Ground Squirrel Habitat Connectivity Draft Schedule

ID	Task Name	Duration	Start	Finish
1	**Task 1 Develop Phase 1 Study Plan**	**78 days**	**Mon 9/13/10**	**Mon 11/29/10**
2	Prepare Study Plan	26 days	Mon 9/13/10	Fri 10/8/10
3	Submit Draft Study Plan to Agencies	0 days	Fri 10/8/10	Fri 10/8/10
4	Agency Review Period	14 days	Sat 10/9/10	Fri 10/22/10
5	Receive Comments from Agencies on Draft Study Plan	0 days	Fri 10/22/10	Fri 10/22/10
6	Revise Study Plan	7 days	Sat 10/23/10	Fri 10/29/10
7	Submit Revised Study Plan to Agencies	1 day	Mon 11/1/10	Mon 11/1/10
8	CEC Workshop	1 day	Mon 11/8/10	Mon 11/8/10
9	Revise Study Plan	8 days	Tue 11/9/10	Tue 11/16/10
10	Submit Revised Study Plan to Agencies	0 days	Tue 11/16/10	Tue 11/16/10
11	Anticipated Agency Approval of Study Plan	1 day	Mon 11/29/10	Mon 11/29/10
12				
13	**Task 2 Prepare for Phase 1 Field Studies and Connectivity Modeling**	**64 days**	**Tue 11/30/10**	**Tue 2/1/11**
14	Purchase Field Equipment	64 days	Tue 11/30/10	Tue 2/1/11
15	Hire Field Technicians, Confirm Qualifications with Agencies	64 days	Tue 11/30/10	Tue 2/1/11
16	Prepare Field Maps	64 days	Tue 11/30/10	Tue 2/1/11
17	Develop Preliminary Desktop Analysis of Vegetative Cover	64 days	Tue 11/30/10	Tue 2/1/11
18	Conduct First Field Visit to Confirm and Record Coordinates of Trapping Locations	1 day	Tue 11/30/10	Tue 11/30/10
19	Conduct Second Field Visit to Confirm and Record Coordinates of Trapping Locations	1 day	Thu 1/6/11	Thu 1/6/11
20	Finalize Selection of Trapping Locations	1 day	Thu 1/6/11	Thu 1/6/11
21	Submit Memo Summarizing Task 2 Efforts and Upcoming Field Sampling	1 day	Thu 1/6/11	Thu 1/6/11
22	CEC Workshop	1 day	Mon 1/17/11	Mon 1/17/11
23				
24	**Task 3 Conduct Phase 1 Field Sampling**	**217 days**	**Tue 2/1/11**	**Mon 9/5/11**
25	**3a/3b/3d. MGS Trapping/ Environmental and Genetic Data Collection**	**135 days**	**Tue 2/1/11**	**Wed 6/15/11**
26	First Trapping Period	43 days	Tue 2/1/11	Tue 3/15/11
27	Second Trapping Period	46 days	Wed 3/16/11	Sat 4/30/11
28	Third Trapping Period	46 days	Sun 5/1/11	Wed 6/15/11
29	3c. Gather Data for MGS Movement	151 days	Tue 3/1/11	Fri 7/29/11
30	Prepare Preliminary Memo of Field Sampling Results	36 days	Mon 8/1/11	Mon 9/5/11
31	Submit Draft Memo to Agencies	0 days	Mon 9/5/11	Mon 9/5/11
32	CEC Workshop	0 days	Mon 9/5/11	Mon 9/5/11
33				
34	**Task 4 Field Sampling, Data Analysis and Connectivity Modeling and Report Preparation During Phase 2**	**60 days**	**Tue 9/6/11**	**Fri 11/4/11**
35	Analyze Phase 1 Field Data and Connectivity Modeling	60 days	Tue 9/6/11	Fri 11/4/11
36	Submit Final Phase 1 Report	0 days	Fri 11/4/11	Fri 11/4/11
37	Public Workshop to Present Results of Analysis and Modeling and Receive Concurrence to Proceed with Phase 2	0 days	Fri 11/4/11	Fri 11/4/11
38				
39	**Task 5. Phase 2 Field Sampling, Data Analysis, and Connectivity**	**364 days**	**Sat 11/5/11**	**Fri 11/2/12**



Project: MGS Schedule
Date: Fri 9/17/10

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

DRAFT - In Progress