Large Mammal Advisory Committee

Approved Project

QUARTERLY PROGRESS REPORT

Project Name: Big game data analysis to model factors that affect wildlife population abundance and change.

Quarter: Time Period: July – April; FY2013/14

Work Performed: Three-month progress reports (July – September 2013, October – December 2013, January – March 2014) are attached.

Funds Expended: see below budget worksheet (for printing use "legal" 8.5 x 14), or separate file: R6 BGMA Budget Track.xls

Work Anticipated for Next Quarter: Refine sampling protocol for newly proposed DNA project in Deer Zone D12. Design random ground survey methodology to be tested in January or March. Continue SNBS survival analysis of male/female and environmental covariates using interactive model.

November 21, 2013

California Department of Fish and Wildlife
Region 6, Inland Desert Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764

RE: Big Game Data Analysis to Model Factors Affecting Wildlife Population Abundance and
Change – 3 month progress report for July–September 2013

Dear Jane:

Below is a list of the main tasks I have worked on over the past 3 months. I will attach all
finished documents to the email containing this letter as well. Please let me know if you need
additional information or have any questions.

1) Literature search and write proposal to Boone and Crockett Club for funding for a project
titled "Estimation of desert mule deer abundance using fecal DNA-based capture-recapture".
The goal of this project is to develop a protocol for ground survey/sampling that will estimate
population abundance, density, survival, and population growth rate of desert mule deer.
This technique can used for population general mule deer population monitoring as well as to
develop a study design to determine the impacts of energy development projects.

   a) Status – underway (as of end of September)

   b) Time spent – 1 week

2) Assist with study design and data analysis to estimate population size and density of
Amargosa voles east of Death Valley.

   a) Status – completed. Data files, results files, and method files that were submitted to
   CDFW attached.

   b) Time spent – 6 weeks

3) Develop and teach a workshop for CDFW employees titled "Introduction to Design &
Analysis of Mark-Resight/Recapture Studies with a Focus on Using Program MARK". This
workshop introduced participants to the use of Program MARK for 3 typical data types used;

Cormac-Jolly-Seber (survival estimation), closed capture (population abundance estimation), and known fate models (survival estimation for telemetry data).

a) Status – underway (as of end of September)

b) Time spent – 0.5 weeks

4) Begin survival analysis for Sierra Nevada bighorn sheep based on a 12-year data set. I worked with Dave German on data formatting, data logistical issues, and began a preliminary analysis for females.

a) Status – underway.

b) Time spent – 0.2 weeks.

5) Assist Jonathan Fusaro with data analysis on project titled "Estimating and Comparing Population Size, Density, and Sex Ratios of Urban and Wildland Black Bear (*Ursus americanus*) Populations Using a DNA-based Capture-Mark-Recapture Approach; Mono County, California".

a) Status – underway

b) Time spent – 0.5 weeks

January 27, 2014

California Department of Fish and Wildlife
Region 6, Inland Desert Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764

RE: Big Game Data Analysis to Model Factors Affecting Wildlife Population Abundance and
Change – 3 month progress report for October–December 2013

Dear Jane:

Below is a list of the main tasks I have worked on over the past 3 months. I will attach all
finished documents to the email containing this letter as well. Please let me know if you need
additional information or have any questions.

1) Literature search and write proposal to Boone and Crockett Club for funding for a project
   titled "Estimation of desert mule deer abundance using fecal DNA-based capture-recapture".
   The goal of this project is to develop a protocol for ground survey/sampling that will estimate
   population abundance, density, survival, and population growth rate of desert mule deer.
   This technique can be used for general mule deer population monitoring as well as to develop
   a study design to determine the impacts of energy development projects.

   a) Completed - Submitted October 15, 2013

   b) Time spent – 1 week

2) Develop and teach a workshop for CDFW employees titled "Introduction to Design &
   Analysis of Mark-Resight/Recapture Studies with a Focus on Using Program MARK". This
   workshop introduced participants to the use of Program MARK for 3 typical data types used;
   Cormac-Jolly-Seber (survival estimation), closed capture (population abundance estimation),
   and known fate models (survival estimation for telemetry data).

   a) Completed – Workshop held in Bishop, CA, October 17–19, 2013

   b) Time spent –3 weeks

3) Begin survival analysis for Sierra Nevada bighorn sheep based on a 12-year data set. I
   completed a first round analysis for females and males separately. I am now waiting on

environmental data from CDFW to complete the analyses. I have also begun the outline of a manuscript; I have been working with Tom Stephenson, Dave German, and others from the Bishop office, as well as Kevin Monteith on the hypotheses and focus of this paper.

a) Status – underway.

b) Time spent – 1 weeks

4) Work on manuscript titled "Population demographic rates of White Mountain desert bighorn sheep in relation to disease". This manuscript is being developed from a CDFW report titled "Population dynamics and spatial distribution of desert bighorn sheep in relation to disease in the White Mountain of California".

a) Status – underway

b) Time spent – 1 weeks

5) Create data sets and homework assignment for workshop participants and work with Bishop office on homework.

a) Completed – conducted half day review in Bishop office Dec 31, 2013.

b) Time spent – 0.4 week

UtahStateUniversity

April 29, 2014

California Department of Fish and Wildlife
Region 6, Inland Desert Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764

RE: Big Game Data Analysis to Model Factors Affecting Wildlife Population Abundance and
Change – 3 month progress report for January –March 2014

Dear Jane:

Below is a list of the main tasks I have worked on over the past 3 months. I will attach all
finished documents to the email containing this letter as well. Please let me know if you need
additional information or have any questions.

1) Develop and teach a second workshop for CDFW employees titled "Intermediate level
   Design & Analysis of Mark-Resight/Recapture Studies with a Focus on Using Program
   MARK". This workshop focused on the more advanced features of Program MARK,
   particularly the design matrix. We focused the use of advanced techniques on closed capture
   and known fate models (survival estimation for telemetry data), but also expanded into the
   family of robust design models, which is a combination of survival and closed capture
   models. I also introduced the mark-resight models that are typically used for bighorn sheep
   data. Finally, I introduced occupancy modeling with 2 lab exercises.

   a) Completed – Workshop held in Bishop, CA, February 1–3, 2014

   b) Time spent –3.5 weeks

2) Continue survival analysis for Sierra Nevada bighorn sheep based on a 12-year data set. I am
   still waiting on environmental data from CDFW to complete the analyses. I have been filling
   in the outline, and have a partial draft of the methods section; I have continued working with
   Tom Stephenson, Dave German, and others from the Bishop office, as well as Kevin
   Monteith on the hypotheses and focus of this paper.

   a) Status – underway.

   b) Time spent – 1 day

3) Finish manuscript titled "Population demographic rates of White Mountain desert bighorn sheep in relation to disease". This manuscript is being developed from a CDFW report titled "Population dynamics and spatial distribution of desert bighorn sheep in relation to disease in the White Mountain of California".

a) Status – awaiting submission pending Tom Stephenson's review. I'm attaching a the draft of the manuscript.

b) Time spent – 1 week

4) Assist Jonathan Fusaro with data analysis on project titled "Estimating and Comparing Population Size, Density, and Sex Ratios of Urban and Wildland Black Bear (*Ursus americanus*) Populations Using a DNA-based Capture-Mark-Recapture Approach; Mono County, California". Also, I thoroughly reviewed both chapters of Jonathan's thesis, which are written in publication format; one for *Ursus* and one for *Human-wildlife Interactions*.

a) Status – underway (thesis almost done!)

b) Time spent – 0.5 week

Budget for FY2013/14

LMAC PROJECT CODE / NC 8001-26; BGMA Fund#0200.33	(4120, 23352) Funding Amount	2013 July	Aug	Sept	Oct	Nov	Dec	2014 Jan	Feb	Mar	Apr	May	June	FISCAL YEAR 13/14 Totals
Personal Services														
Principle Investigator (PI)	$138,505.02				12,266.66			9,200.00			6,251.71			27,718.37
Research Scientist (RS)	$30,872.37									2,440.00	1,960.00			4,400.00
														0.00
Benefits														
PI	$61,311.11				5,568.20			4,176.15			2,937.23			12,681.58
RS	$2,547.87													0.00
														0.00
Subtotal Personal Services	$233,236.37				17,834.86			13,376.15		2,440.00	11,148.94			44,799.95
Operating Expenses & Equipment														
Travel	$7,409.99				0.00			397.99			404.78			802.77
					0.00			0.00			0.00			0.00
Subtotal Personal Services and OE&E	$240,646.36				17,834.86			13,774.14		2,440.00	11,553.72			45,602.72
PI and RS Indirect Costs (IDC)	$42,113.12				3,121.08			2,437.15			2,079.22			7,637.45
Total Expenses	**$282,759.48**				**$20,955.94**			**$16,211.29**		**$2,440.00**	**$13,632.94**			**$53,240.17**
Paid (Minus 10% withheld)					**$18,860.35**			**$14,590.16**		**$2,196.00**	**$12,269.65**			**$47,916.15**

Total Personal Services Expenses + IDC to date	$52,437.40	Total invoiced	$53,240.17
Total OE&E Expenses to date	$802.77	Withholding 10%	$5,324.02
Total Personal Serviced Expense + IDC Remaining to date	$222,912.09	Total Paid	$47,916.15
Total OE&E Remaining to date	$6,607.22	Total Remaining to be invoiced	$229,519.31

Notes

Budget tracking based on invoices received.

Contract # P126003; start date July 1, 2013

Dr. Mary Conner, USU

Project Title: Big game data analysis to model factors that affect wildlife population abundance and change.

The Contractor shall be paid quarterly, in arrears, upon submission of an original and two copies of the invoice, which properly details all charges, expenses, direct and indirect costs.

California Department of Fish and Wildlife shall retain from the Contractor's earnings for each period for which payment is made, an amount equal to ten percent (10%)

    of such earnings, pending satisfactory completion of the task or Agreement.