Big Game Management Account Project Proposal 2015

LOWER SACRAMENTO RIVER CORRIDOR DEER PRE-HUNT POPULATION ASSESSMENT 2015 - 2017

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PURPOSE

Deer that inhabit the section of the lower Sacramento River corridor from the town of Red Bluff south to Colusa are currently causing extensive damage to orchards and alfalfa crops adjacent to the river. Anecdotal evidence suggests that this population is increasing and a commensurate amount of additional crop damage is a real concern by the public. Further evidence suggests that this population also exhibits exponential growth patterns punctuated by widespread die-offs during periods of flooding along the river from temporary loss of habitat due to high water and also from lung worm infestation. To alleviate the crop damage and periodic die-offs and provide additional hunter opportunity, an either-sex special hunt program is being pursued by the Department in cooperation with the respective county Fish and Game Commissions, the US Fish and Wildlife Service, and private land owners.

In order to derive a level of deer harvest (including females) that is sustainable, scientifically defensible, and adheres to responsible resource management, the collection of baseline and follow-up population data is vital to parametrize predictive population models.

This project is a collaborative effort between CDFW Programs Branch, Northern Region, North Central Region, US Fish and Wildlife Service, and private landowners.

STUDY AREA

The study area is approximately 113 km (70 miles) in length and contains roughly 360 km^2 (140 mi^2) of riparian habitat along the lower Sacramento River from Red Bluff to Colusa in the Counties Tehama, Glenn, Butte, Colusa, and Sutter and Colusa (Figure 1). Deer hunt zones in the area include C4 and D3. Habitat is predominately riparian bordered by agriculture; mainly orchards, vineyards, and alfalfa. Deer in the study area are non-migratory and are confined to the riparian strip along the river with foraging forays into the adjacent agricultural areas.

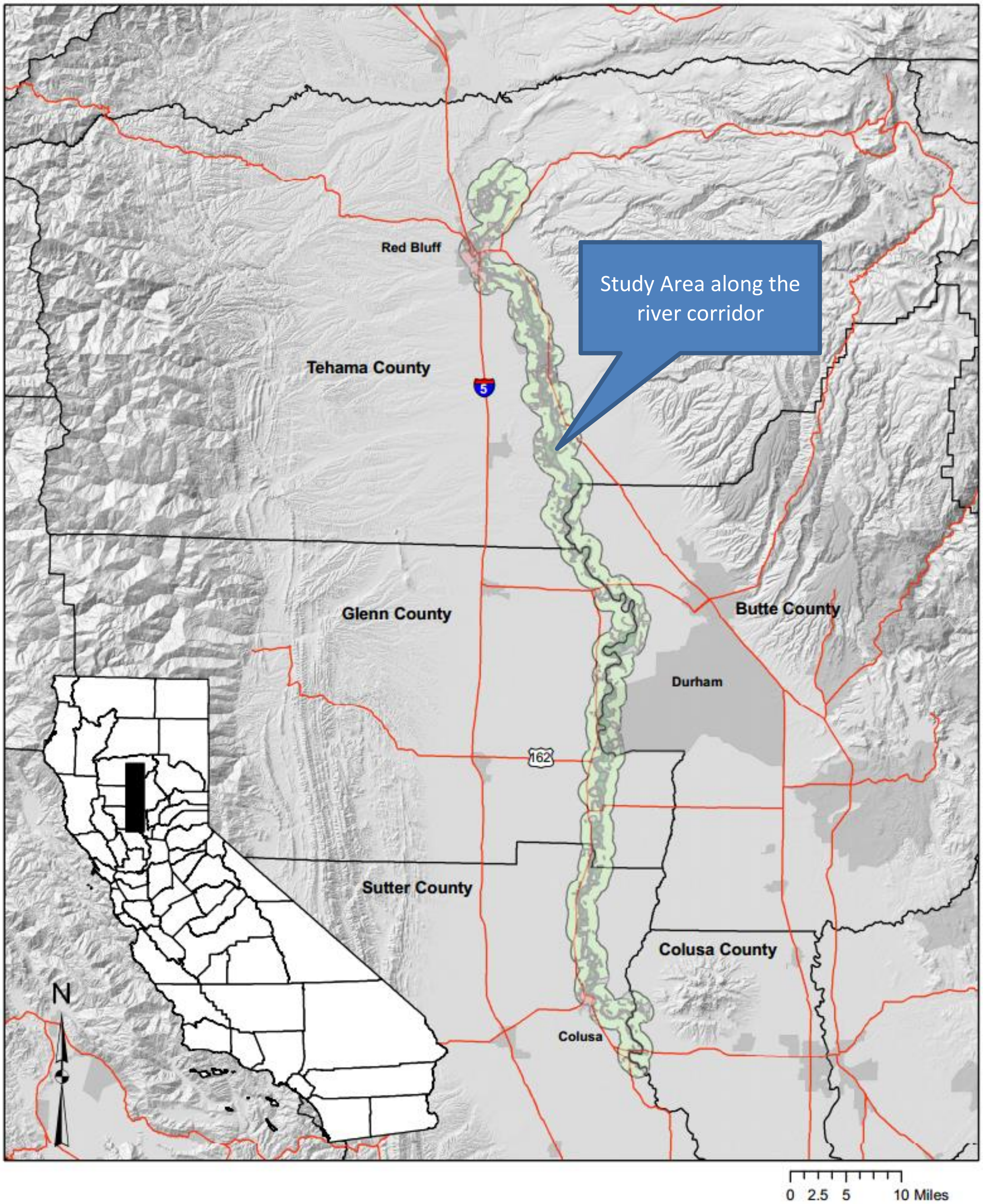

Figure 1. Lower Sacramento River Deer Population Assessment Project Area, California

METHODS

Abundance will be estimated using 2 methods. The primary method will be a pellet DNA mark-resight approach following the procedures presented in Lounsberry et al. 2015 whereby we will establish 2 meter wide belt transects up to 1.2km in length at random starting locations derived from a sampling frame overlaid on a map of the project area. DNA samples will be analyzed by the UC Davis genetics laboratory to determine individual identities. Effective sampling area for this approach will require estimates of home range sizes for both adult males and adult females. The second method will likewise use a mark-resight approach by re-sighting individuals with physical marks (radio collars and ear tags). Radio-collars will also allow us to test for population closure during abundance estimation periods.

Population rates and direction of change (apparent and realized estimates of λ) will be estimated using adult female survival rates obtained from the GPS radio collars and juvenile survival from adult to juvenile observational ratio data collected using transect and/or quadrat sampling approaches. These data will be used to parametrize matrix population models following procedures in Marescot et al. 2015. Additionally, IFBF will be measured with ultrasonography to estimate λ as presented in Monteith et al. 2014.

The sustainable harvest levels for this population will be modeled using the Department's current deterministic accounting model approach (i.e., Killvary), as well as a refined and more robust version (Killvary 2.0). Other modeling approaches will also be employed including stock-recruitment type models and other appropriate methods.

All animal handling and capture methods will follow procedures outlined in the CDFW Wildlife Investigations Laboratory Handling and Restraint Handbook (2010) and those presented in Casady and Allen 2013, Wittmer et al. 2014, and Kreeger et al. 2002. A formal capture plan and signature cover page is attached.

KEY PERSONNEL

Project Lead – David Casady, CDFW Wildlife Programs Branch (WPB)
Regional Coordinator – Henry Lomeli, CDFW North Central Region (NCR)
Capture/Drug Lead – David Casady
Experimental Design – David Casady, Brett Furnas (WPB), Russ Landers (WPB)
Fecal Data Collection – CDFW Scientific Aids (WPB)
Animal Monitoring – Regional Personnel (TBD) with Program and USFWS support
Transect/Quadrat Sampling – Regional Personnel (TBD) with Program and USFWS support
Data Analysis and Report Preparation – David Casady, Russ Landers, Brett Furnas
Lead Veterinarian – Ben Gonzales, CDFW Wildlife Investigations Laboratory (WIL)
Lab Support – Lora Konde, (WIL)

IMPLEMENTATION SCHEDULE

Component	Year	Months	Responsible Unit	Personnel Assigned
Project Proposal	2015	May	WPB	Casady
Capture Plan	2015	May	WPB	Casady
Materials Acquisition	2015	May - June	WPB	Casady/Itoga
DNA Experimental Design	2015	June	WPB	Casady/Furnas
Fecal Collection	2015-2016	July	WPB/REG	Scientific Aids
Capture and Handling	2015-2016	TBD	WPB/REG	Casady/Lomeli
Ultrasonography	2015 -2016	TBD	WPB/WIL	Casady/Konde
Ratio Data Experimental Design	2015	June	WPB	Casady/Landers
Ratio Data Collection	2015-2017	August	REG/USFWS	TBD
Data Analyses	2017	July - Nov	WPB	Casady/Landers
Report Preparation	2017	Nov - Dec	WPB	Casady

BUDGET ESTIMATES

Component	Rate	Year 1 (2015-16)	Year 2 (2016-17)	Year 3 (2017)	Total
Internal Staff Time					
1. Scientific Aid Salary and Benefits	170hrs x 4 x 15	$10,200	$10,200		$20,400
2. Per Diem	Variable	$10,000	$10,000	$5,000	$25,000
Operating					
1. GPS Collars	20 male + 20 female	$100,000			$100,000
2. Biological Sampling Equipment	Variable	$400	$400		$800
3. Capture Equipment (incl. drugs)	Variable	$5,000	$5,000		$10,000
4. Misc. equipment	Variable	$2,000	$2,000		$4,000
Totals		**$127,600**	**$27,600**	**$5,000**	**$160,200**

LITERATURE CITED

Casady, D.S. & Allen, M.L. 2013. Handling adjustments to reduce chemical capture–related mortality in black-tailed deer. California Fish and Game 99:104-109.

Kreeger, T., Aremo, J., & Raath, J. 2002. Handbook of wildlife chemical immobilization. Wildlife Pharmaceuticals, Fort Collins, Colorado, USA.

Lounsberry, Z.T., Forrester, T.D., Olegario, M.T., Brazeal J.L., Wittmer, H.U. & Sacks, B.N. 2015. Estimating sex-specific abundance in fawning areas of a high-density Columbian black-tailed deer population using fecal DNA. Journal of Wildlife Management 79(1):39-49.

Marescot, L., Forrester, T.D., Casady, D.S.& Wittmer, H.U. 2015. Using multistate capture-mark-recapture models to quantify effects of predation on age-specific survival and population growth in black-tailed deer. Population Ecology 57:185-197.

Monteith, K.L., Bleich, V.C., Stephenson, T.R., Pierce, B.M., Conner, M.M., Kie, J.G. & Bowyer, R.T. 2014. Life-history characteristics of mule deer: effects of nutrition in a variable environment. Wildlife Monographs 186:1-62.

Wildlife Investigations Lab. 2010. Wildlife restraint handbook. Tenth edition. California Department of Fish and Wildlife, Rancho Cordova, USA.

Wittmer, H.U., Forrester, T.D., Allen, M.L., Marescot, L. & Casady, D.S. 2014. Black-tailed deer population assessment in the Mendocino National Forest, California. Report to the California Department of Fish and Wildlife.