California Department of Fish & Wildlife

Upland Game Bird Account Project Proposal

Project Title and Description: A TWO YEAR RECONISANCE STUDY INTO POPULATION VITAL RATES AND SPACE USE OF PHEASANT IN THE CENTRAL VALLEY, CALIFORNIA

The project proposal must clearly identify benefits to upland game birds, upland game bird hunting opportunities, or public hunting outreach (Fish and Game Code Section 3684c).

CDFW or Non-Governmental Organization project contact:
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Project start and completion dates by State Fiscal Year (July 1 – June 30): Fiscal Years 2012&2013 -April 1, 2013 to December 30, 2014

Location: California Department of Fish and Wildlife Region and location of proposed project: Gray Lodge Wildlife Area, Sacramento National Wildlife Refuge Complex and Mandeville Island. Regions Two and Three

OBJECTIVES:

We propose financial support for a reconnaissance study that is critical to developing a longer term in-depth investigation of factors that influence pheasant and turkey populations in the Central Valley, California. This study will include field operations, data collection, and analytical approaches aimed at answering basic questions regarding upland game bird populations. On-the-ground monitoring will be carried out during the spring and summer seasons with less frequent monitoring during fall and winter. Details of the monitoring and analyses are listed below. The objective of this proposal is to develop collaboration between CDFW, USGS and other partners to carry out a pilot effort for field monitoring and research aimed at guiding effective management of pheasant and turkey populations in California. The primary study objectives include:

1. Investigate the nesting success of both Pheasants and Turkeys using video-monitoring.
2. Investigate the brood success of both Pheasants and Turkeys and assess field methodology for capturing marking and monitoring individual pheasants using VHF telemetry.
3. Evaluate methodologies for estimation of population vital rates (nest, brood, juvenile, and adult survival) and identify potential influential factors on those vital rates.
4. Identify movement patterns using GPS technology.

5. Identify and analyze food habits for both pheasants and turkeys during the brood rearing period.
6. Conduct preliminary invertebrate availability studies in locations where mosquito abatement, seasonal flooding and other management practices differ.
7. Evaluate pheasant and turkey use of intensively managed habitats for brood rearing.
8. Quantify territorial turkey behavior and interactions between turkey and pheasant using audio playbacks of crowing pheasant.

BENEFITS:

These findings will provide information for a multi-year study to estimate the factors that may influence pheasant declines, refine our understanding of the behavioral interactions of Turkeys and Pheasants and provide relevant information for CDFW wildlife managers to inform decisions regarding pheasant and turkey management. These specific field objectives will be further refined and assessed during this two year study:

1. Spotlighting and funnel trapping techniques,
2. Blood and feather sampling for disease analysis,
3. Fitting of VHF transmitters and GPS/PTT-transmitters,
4. Behavioral observations from a blind using audio playbacks of cock-crowing pheasant,
5. Locating and monitoring nest sites,
6. Installation of video cameras and recorders at nest sites,
7. Locating and counting chicks,
8. Sampling chicks from broods using spotlighting techniques for crop analysis,
9. Surveys for corvids and raptors at nests and brood sites,
10. Collecting both pheasant chicks and turkeys polts to contrast food preference selection,

Collecting ravens and pellets to facilitate developing a food habits profile

Schedule of project tasks: A brief project summary is required annually for multi year projects and a final project report by August 1st following the fiscal year of project completion. Please summarize your projected tasks by date:

Tasks	Start Date	Finish Date
Brief Description of Tasks: • *Capturing Pheasant.* Pheasants will be captured ($n \geq 40$, approximately 4:1 female:male) using spotlighting techniques (Wakkinen et al. 1992, Giesen et al. 1982) during the fall and spring of each year. Captured pheasants will be aged, weighed, sexed, banded, and measured including total tarsus, culmen, wing chord and primary 1,9,10. Measurements will be used to calculate body condition indices and age birds. • *Food habits collection.* Collections will be	2013 Field Season April 1 2014 Field Season March1	June or whenever quota is reached

made of at least 20 pheasant chicks and 20 turkey polt during observed feeding bouts to look at potential competition between species. Shotguns will be the primary collecting tool. In addition, six (6) Ravens will be collected to conduct preliminary food habits analysis.	May and June of each year	
• *Invertebrate availability.* Samples will be taken in pheasant foraging areas at two week intervals during April –June to ascertain species richness and availability. In addition, associated wetland will also be sampled for invertebrates once per month.	April15-June 15 each year	
• *Blood Sampling.* Blood will be extracted from the brachial vein for disease testing.	Blood will be taken as part of trapping	
• *VHF- and GPS/PTT Transmitter Installment.* Nearly all captured pheasant will be fitted with necklace style VHF-transmitters (<3% of body mass). At least two pheasant will be fitted with a rump-mounted GPS/PTT device. Two pheasant have been fit with rump-mounted harnesses during 2012 at the USGS, Dixon Field Station. Pheasant were monitored for injury and adjustment of harness. These preliminary measures suggest rump-mounted harnesses are an effective technique that does not cause injury to pheasant. This GPS transmitter technology has multiple benefits over conventional radio-telemetry. For example, GPS are necessary to reliably identify year-round locations and obtain fine-scale movement patterns. Transmitters with GPS technology are not limited to access or weather conditions and provide reliable relocations, allowing data to be collected without a year-round field technician. A relatively small (8-g) VHF-transmitter will be placed on the GPS to relocate the transmitter following fatality or GPS signal failure. Data from the GPS transmitters will be downloaded from the ARGOS website and post-processed using various computer software and quality control measures. Pheasant will be released at the point	Transmitters will be placed during trapping and replaced as necessary	

of capture. Radio-transmittered pheasant will be relocated by ground every 2 – 3 days and locations will be recorded using hand-held GPS.		
• *Behavioral observations.* At specific breeding locations, we will use audio playbacks of pheasant cock-crowing and observe encounters by turkey and pheasant. We will make observations from nearby blinds and behavioral data will be recorded and quantified. A pheasant decoy or live pheasant contained within a small enclosure (e.g., chicken wire pod) might be used to record and quantify antagonistic behavior by turkey and pheasant.	April 15 to May 15 each year	
• *Nest Location and Video-Monitoring*. Monitoring will begin in March and continue through May. We will use portable VHF receivers and hand-held antennas to track VHF-marked pheasant and minimize location error by circling each pheasant at a radius of 30 – 50 m. Locations of female pheasant will be determined to within approximately 30 m every two days throughout the nesting season using a portable receiver and hand-held antenna. Care will be taken to not disturb the females. Transmitters will be equipped with an activity sensor and we will assume females are nesting when movements become localized and/or activity sensors indicate long periods of inactivity. By locating the female and her nest site, data can be collected on timing of incubation, nest failure, and nest success. Variation in transmitter signal frequency will help indicate female behavior. Nest locations will be mapped using a GIS. A sub-sample of nests will be monitored continuously (day and night) using digital video recorders and microcameras equipped with infrared light emitting diodes (>750 nm wavelength). The videography will be used to identify predators and interactions with turkeys. When monitoring indicates that a female has terminated the nesting effort, nest fate will be determined by examining the chorioallantoic	April 1-July 30 of each Year	

membrane, allantoic sac, and broken eggshells. A membrane that is detached from the eggshell will be classified as a successful hatch. We will determine clutch size when possible by counting eggshells following a successful hatch or the destruction of the nest within five days of the females' departure from the nest site.		
• *Brood Location, Counting, and Chick Sampling.* For females that successfully hatch, we will continue on-the-ground locations of broods using VHF-monitoring. We will locate radio-marked females with broods once each week to help evaluate brood rearing habitat. Weekly locations will be divided into three time periods: morning (within 4 hr after sunrise), mid-day (>4 hours after sunrise to >4 hours before sunset), and evening (within 4 hours before sunset) (Dunn and Braun 1986). We will estimate fledging success as the percent of females that produces ≥1 chick ≥50 days old (Schroeder 1997). Areas important to brood-rearing will be identified. We will locate and count chicks every 10 days (intervals) following hatch. During each interval post-hatch, broods will be approached using pointing dogs, counted, and feather samples will be collected from ≥1 chick when it is possible. Spotlight surveys will also be conducted at night to confirm chick numbers and brood survival. If no chicks are located with the female pheasant day or night, then a follow-up survey will be conducted within 24 h to confirm brood failure.	May 1, August 15, of each year	
• *Adult and Juvenile Survival*. Radio-transmitters will be equipped with mortality sensors that will double the pulse rate of the transmitter after eight hours of no movement. During the non-breeding season, flights will be conducted as needed to relocate pheasant with VHF and determine status (i.e., alive or mortality).	August 1 to February 28th of each year	
• *Raven and Raptor Monitoring.* We will conduct point surveys for ravens and raptors throughout	April 15 to	

study sites from 15 April – 01 August each year. We will use binoculars to count the numbers of avian predators, flying or perched, at each point. Rangefinders and compasses will be used to calculate a projected UTM coordinate of each avian predator. We will use generalized linear models to estimate occurrence of ravens and raptors. To understand factors that influence raven and raptor populations we will investigate metrics related to various anthropogenic factors (e.g., distance to trees or power lines) in the probability of occurrence models. We will further calculate density estimates for each species by habitat type. Raven and raptor densities will be estimated in relation to anthropogenic structures, roads, and landscape characteristics.	August 1 of each year	
• *Data Collection and Storage.* We will maintain a database of all morphological, telemetry, and vegetation information collected within the study area. Data will be collected in the field using personal digital assistants (PDA's).	April 1,2013 until March 1 of 2015	

BUDGET: Itemized budget for CDFW, USGS, Pheasants Forever collaborative pheasant and turkey pilot project for FY2012& 2013 in the Central Valley, CA

BUDGET ITEM	DESCRIPTION	FY12/FY13
Employment	Biological Field Technician (1 for 10 months)	$30,000
	Research Wildlife Biologist (0.30 FTE)	$20,000
	Lab Technician (6 months)	$18,000
Equipment	Global Positioning System Transmitters (6 @ $5,000/unit includes data acquisition and processing)	$30,000
	Video-monitoring equipment	$10,000
	VHF Transmitters (40 @ $225/unit)	$9,000
	VHF Receivers (4 @ $1000/unit) and antennas	$5,800
	Survey Equipment (bird and insects)	$4,000
	Two vehicles (10 months)	$14,000
Processing	Genetic and disease	$5,000
	Flights (6 @ $2000)	$12,000
Overhead	Pheasants Forever	$12,200
TOTAL REQUEST		**$85,000**
Total Cash Match		**85,000**
Total In-Kind Match		**76,502**
PROJECT TOTAL		**246,502**

State the measurable products expected to result from this project and how the effectiveness will be evaluated.

See specifics under Benefits section. Two years of reconnaissance work will allow for a better grounded field effort when combined with the parallel track of the Pheasant Status Report. The Status Report should be completed prior to the field management and research field season in the spring of 2015; FY 2014. Quite literally the pheasant management program will be able to hit 60 mph right out of the gate when all of the field findings and the documentation and analysis of past landscape and management changes converge.

List any CDFW personnel participation by name and classification:

Name: Scott Gardner	Classification: Staff Environmental Scientist
Name: Matt Meshriy	Classification: Environmental Scientist
Name: Stella Mcmillian	Classification: Investigation Laboratory
Name: Andy Atkinson	Classification: Senior Environmental Scientist

Non-Governmental Organization and other Agency Contributions	
Organization/Agency Name	% of Matching Funds and/or Volunteer Effort
Cash Pheasants Forever	$85,000/50% match
In Kind USGS Research Wildlife Biologist (0.2 FTE) VHF Receivers, antennas, misc. telemetry equip Trapping and other field gear Computing, GIS, and lab equipment Volunteer and internships (equivalent to 300 per. Hours) Regional Biologist for PF at 160 hrs	 $40,000 $15,000 $5,000 $10,000 $2,000 $4,502
Total	$161,502

Total Project Funding	
Item of Expense (salary & wages, equipment, supplies, etc)	Amount
Total Requested Funding	$85,000
Total Matching Funds	$161,502
Total Project Costs	$246,502