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Wildlife Heritage Account Project Proposal Form

APPLICANT INFORMATION

Person/Organization/Agency: Cody Schroeder - Nevada Department of Wildlife

Date: 12-17-2019 (revised 4/10/2020)

Name: Cody Schroeder Title: Wildlife Staff Specialist
 Address: 6980 Sierra Center Pkwy. City: Reno
 State: NV Zip 89511 Phone: 688-1659
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 Other: _____

PROJECT INFORMATION

Project Title: A New Population Model for Antelope to Improve Accuracy, Identify Limiting Factors, and Improve Management Decisions

State Fiscal Year(s) Wildlife Heritage Account Funds are Needed: FY2021

Project Location: Statewide project; however, some radio collar data will be derived from 3 primary study areas (Fig. 1) in Nevada.

Heritage Account Funds Requested: \$37,500

Is a Project Map Attached? Yes No

(a map **must** include the project title, map scale, date map was created, and a north arrow)

Purpose of the Project:

The purpose of this project is to develop a new population model for antelope in Nevada. The project will include a preliminary analysis of existing population data, development of a new model by Speed Goat LLC, and incorporation of a web-based user interface (Nowak et al 2018). A more advanced population model will allow NDOW to accurately estimate populations and identify factors limiting those populations. The benefit to the sportsmen of Nevada and the public in general, will be better accounting of wildlife populations, a science-based management tool, and proper allocation of hunting permits to allow a sustainable harvest. Additionally, it will allow NDOW to identify sources of population variability (such as drought, vegetation indices, body condition, survival rates) that may be improved through targeted habitat manipulations and predator control if necessary.



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Detailed Description of Project (include any development plans such as vegetation removal, planting, seeding, or installation of structures; also include the schedule for obtaining any necessary permits, completing NEPA compliance, etc.):

Nevada has been using spreadsheet population models for antelope and other big game species for several decades. While these models have proven very useful for providing estimates of population size and a solid foundation to base tag quota recommendations, they are limited in their ability to make predictions and relate environmental conditions (e.g. changes in habitat quality, precipitation, or winter severity) to changes in population growth rates. NDOW's current population models also lack variance estimates such as confidence intervals or other measures of uncertainty. An improved population model would allow NDOW to help identify limiting factors impacting antelope populations (such as drought, vegetation, severe weather, or predator communities) to better manage populations and make sound harvest recommendations.

Integrated population models (IPMs) are advanced statistical models (Nowak et al 2018) that offer a new approach to modeling wildlife populations that incorporate multiple sources of data such as helicopter counts, radio-collar data, habitat indices (Hurley et al 2017), and harvest data. The IPM incorporates both natural variation (changes in demographic rates) and sampling error. Typically, wildlife managers are only interested in natural variation and what factors may influence population change; however, we also need to account for sampling error to accurately assess our estimates of population size and other demographic parameters such as age and sex ratios.

This project will build upon the current development of an integrated population model for mule deer (Speed Goat LLC) and expand it to antelope using data provided by NDOW. We will initiate this process by providing Speed Goat LLC, under contract with NDOW, a sample set of data from a few select antelope herds throughout the state that are representative of typical habitats and antelope densities. Once the data entry and modeling processes are streamlined, minimal effort will be required for NDOW biologists to enter a new survey, radio-collar information, and harvest data each year. This project will also leverage funds from several recent projects for migratory species such mule deer and antelope in Nevada by using collar data and movement information from a large sample of animals to make inferences about population ecology and growth rates of various herds throughout the state (Fig. 1).

References:

Hurley, M. A., Hebblewhite, M., Lukacs, P. M., Nowak, J. J., Gaillard, J. M., & Bonenfant, C. (2017). Regional-scale models for predicting overwinter survival of juvenile ungulates. *The Journal of Wildlife Management*, 81(3), 364-378.

Nowak, J. J., Lukacs, P. M., Hurley, M. A., Lindbloom, A. J., Robling, K. A., Gude, J. A., & Robinson, H. (2018). Customized software to streamline routine analyses for wildlife management. *Wildlife Society Bulletin*, 42(1), 144-149



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How Does this Project Meet the Objectives of the Wildlife Heritage Program? (See NRS 501.3575)

This project meets the objectives of the Wildlife Heritage Program in several ways. By focusing our research on obtaining more accurate and precise population estimates of antelope, we can provide agency biologists, Wildlife County Advisory Boards, the Nevada Wildlife Commission, and the general public with the most reliable and up-to-date information available. We can also use the information to help focus restoration efforts on habitats that have been lost to wildfires, fragmentation, and development from industry. Finally, this project meets the objective of using the best available science for the management of antelope and other wildlife in Nevada.

Legal Description of the Property on Which the Proposed Project is to be Located (must include the property address, access roads, township, range and section):

Statewide. These are free-ranging populations that span across various land ownership boundaries hence, legal descriptions don't necessarily apply. However, harvest data, survival rates, and vegetation indices will be primarily derived from Nevada Game Management Units, except where migratory herds may cross state boundaries.

Does this Project Have Additional Funding Sources Other than Your Wildlife Heritage Account Request? Yes No

Does this Project Involve Habitat Restoration and Improvement of a Long-term or Permanent Nature? Yes No

Please Describe in Detail the Reason Why You Need Wildlife Heritage Account Funding to Fund this Project:

Heritage funds will be used in conjunction with several other sources including Pittman-Robertson Federal Aid funds and private donations. By receiving Heritage dollars, we can secure additional federal funds at the rate of 3:1, effectively quadrupling the total amount of funds being used towards this worthy endeavor.

Project Duration: one year two years three years more

Estimated Start Date: July 1, 2020

Estimated End Date: June 30, 2022



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PROJECT FUNDING

The funding breakdown below should only be for the upcoming fiscal year. While projects may be extended beyond the first fiscal year, such an extension must be due to unusual circumstances and approved by the Wildlife Commission (see NAC 501.340). Double click on the table to activate the embedded spreadsheet.

1. Wildlife Heritage Account Cash Amount Requested		\$ 37,500.00
2. Other Cash Funding Sources for this Project		
a. Federal Aid Pitman-Robertson		\$ 12,500.00
b.		
c.		
d.		
e. Total Other Cash Funding Sources (lines a - d)		\$ 12,500.00
3. Donations or In-kind Services for this Project		
a. Volunteer Time		
b. Equipment		
c. Materials		
d.		
e.		
f.		
g.		
h. Total Donations/In-kind Services (lines a - g)		\$ -
4. Total Project Funding	\$ 50,000.00	



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PROJECT COSTS

The cost breakdown below should only be for the first fiscal year of the project. While projects may be extended beyond the first fiscal year, such an extension must be due to unusual circumstances and approved by the Wildlife Commission (see NAC 501.340). Double click on the table to activate the embedded spreadsheet.

	Heritage Costs	All Other Costs
1. Land Acquisition		
2. Personnel (NDOW employee costs can't be included)		
3. Travel (NDOW travel costs can't be included)		
a. Per diem costs for population workshop		\$ 2,000.00
b. Mileage for instructors		\$ 500.00
c. Total Travel Costs (lines a & b)	\$ -	\$ 2,500.00
4. Equipment Items		
a.		
b.		
c.		
d.		
e. Total Equipment Costs (line a - d)	\$ -	\$ -
5. Materials		
a. Computer maintenance and server use		\$ 5,000.00
b.		
c.		
d.		\$ -
e. Total Material Costs (lines a - d)	\$ -	\$ 5,000.00
6. Miscellaneous Costs		
a. Contract services for analysis of data	\$ 37,500.00	
b.		
c.		
d.		
e. Total Miscellaneous Costs (lines a - d)	\$ 37,500.00	\$ -
7. Total Heritage Costs Only (add lines 1, 2, 3c, 4e, 5e, 6e)	<u>\$ 37,500.00</u>	
8. Total All Other Costs (add lines 1, 2, 3c, 4e, 5e, 6e)		<u>\$ 7,500.00</u>
9. Total Project Costs (add lines 7 & 8)	<u>\$ 45,000.00</u>	
(Note: total project funding from previous table must match total project costs)		



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Are there going to be any Ongoing Costs for this Project? Yes No

If there are Ongoing Costs Associated with this Project, is there an Anticipated Funding Source for These Costs? Yes No

Do You Anticipate Needing Additional Wildlife Heritage Account Funds Beyond the Upcoming Fiscal Year? If So, Please Describe What You Think Your Funding Requirements will be and for What Purposes (As noted above, extensions beyond the first fiscal year must be due to unusual circumstances and approved by the Wildlife Commission.):

Yes, approximately \$5,000 per year would be required to maintain data storage and use of servers for this analysis. We anticipate using internal sources and Federal-Aid match to cover the costs for up to three years.

How Will You Give Credit to the Wildlife Heritage Account and Other Funding Sources?

The Wildlife Heritage Account will be acknowledged by the department in any professional presentations or informal public meetings. Additionally, we will acknowledge the Wildlife Heritage Account in professional publications such as scientific journals or any media-related publications such as news media outlets and departmental press releases.

Athorizing Signature:

Review Date: 4/10/2020

Figure 1. Preliminary map of pronghorn (Antelope) movements from three study areas throughout northern and central Nevada. Animals were captured and radio-collared in Washoe and Elko counties in Fall of 2019. The proposed project will incorporate these spatial data into an integrated population model.

