

# Dream Tags Charitable Fund Open Request for Proposal

## Cover Sheet

<b>Organization Name:</b> The Nature Conservancy		<b>Office Use Only</b>		
<b>Organization Type:</b> <b>501(c)(3) EIN#</b> 53-0242652		Date received:		
<b>Governmental entity?</b> <input checked="" type="checkbox"/> <b>N</b>		Project #		
<b>Address:</b> 1 E. First St., Suite 1007, Reno, NV 89523		Grant Amount:		
<b>Project Name:</b> Mapping mule deer habitat suitability for restoration planning <b>Is this proposal being submitted as an Emergency funding request? (Circle one) Yes / <input checked="" type="checkbox"/> No</b>				
<b>Amount requested:</b> \$26,695.85		<b>Website:</b> www.nature.org		
<b>Project start date (mm/yyyy):</b> 10/2017		<b>Projected completion date (mm/yyyy):</b> 9/2018		
<b>This funding will be used to (complete this sentence with a max of 2 sentences):</b>				
<b>Key People:</b>	<b>Director:</b>	Juan Palma		
	<b>Board Chair:</b>	Joel Laub		
	<b>Project Contact:</b>	<b>Name:</b>	Kevin Badik	
		<b>Position:</b>	Rangeland Ecologist	
		<b>Phone:</b>	775-322-4990 ext. 3119	
		<b>Fax:</b>	775-322-5132	
<b>Email:</b>		kevin.badik@tnc.org		
<b>Organization Mission:</b> The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.				
<b>Project is on (check all that apply) <input checked="" type="checkbox"/> Public <input checked="" type="checkbox"/> Private land.</b>				
<b>Are government permits or decision documents needed for the project? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</b> <b>If so, are those permits and decision documents already secured? <input type="checkbox"/> Yes <input type="checkbox"/> No</b> <b>If permits and decision documents are needed but not yet secured, in #4 of the Narrative Requirements provide a list of permits and documents needed and a schedule for securing them.</b>				
<b>Has your organization received other grants from the Dream Tags Fund? Yes/No</b> (use additional pages to list ALL funded projects)	If yes,			
	Date awarded:			
	Project # & title:			
	Amount of Award:			
	Date awarded:			
	Project # & title:			
Amount of Award:				

## **Description of Project Under Consideration**

This project best fits under: A) Projects that improve, protect, and restore habitat and B) Projects that embrace unique opportunities for advancing the mission of wildlife conservation in Nevada

### **1. Project Goals and Measurable Outcomes**

The primary goal of this project is to provide mule deer habitat suitability maps for Nevada's Department of Wildlife staff in two areas where recent fires have impacted mule deer habitat. Habitat suitability maps assign values for each pixel based on the quality of habitat as determined by environmental and anthropogenic characteristics. These habitat suitability maps will be highly valuable for prioritizing where funds should be expended on habitat restoration projects in the future. The secondary goal is to create a method for NDOW staff which uses free spatial data to map habitat suitability in new areas to inform planning mule deer and other species management, especially where previously collected data are lacking. The project has four measurable outcomes: (1) a completed workshop with Nevada mule deer biologists to describe and refine the equations describing the effects of environmental characteristics on mule deer habitat quality; (2) the creation of spatial data layers that will be used to generate the individual components of the habitat suitability maps; (3) a final habitat suitability map at 30-m resolution, which matches the native resolution of the vegetation data that will be used; and (4) a report detailing the process so that it can be easily replicated by NDOW for mule deer and other species using publicly available data.

### **2. Project location**

The project is proposed in two areas where existing data can be leveraged. In 2013 TNC captured and interpreted high resolution satellite imagery for the TS-Horseshoe Ranch (521,085 acres) and the IL Ranch (485,732 acres). The TS-Horseshoe Ranch is situated between Carlin and Argenta, bisected by Interstate 80. The IL Ranch is bordered to the north by the Idaho state line and contains the Owyhee Allotment of the Bureau of Land Management and the northern Independence Range (Fig. 1). These properties provide crucial habitats for mule deer, during summer, winter, and transition (migration) periods and experienced recent fires where postfire rehabilitation is likely.

### **3. Project Description**

**Problem:** NDOW lacks a range-wide mule deer habitat suitability map that effectively meets the needs of managers, due in part to the inability to utilize and extrapolate upon field-based knowledge and translate it to available geospatial data. While NDOW has maps which show the extent of seasonal habitat-use for mule deer, which do not show the *quality* of habitat and thus limiting managers' ability to plan and implement successful actions. Common methods for generating habitat suitability maps require large datasets to accurately model habitat use. Collecting the data for traditional approaches can be costly and requires a great deal of time. For example, recent fires in central Nevada in 2016 and 2017 have impacted mule deer use in and near the project areas. However, NDOW staff do not have a way to prioritize projects within the burn perimeters, outside of coarse habitat use designations.

Advancing techniques that leverage available data and expert knowledge will improve the ability to map habitat suitability and provide the information necessary to prioritize habitat improvement projects.

**Methods:** The first task will be to create a vegetation map for each landscape from publicly available geospatial datasets: (i) the 30-m resolution LANDFIRE vegetation layers, (ii) 2016 USGS annual grass index map, (iii) National Wetland Inventory (NWI) geodata, and (iv) recent and past NV fires. The LANDFIRE data need to be combined with the other sources as LANDFIRE data alone do not have the resolution needed to accurately describe mule deer habitat needs. We will use the high-resolution imagery from our previous work to refine the creation of the vegetation maps from publicly available data.

The next task will be to update the habitat suitability models for mule deer at the LANDFIRE data resolution. While TNC and NDOW have previously generated habitat suitability equations, those were at the finer resolution and thus do not directly translate to the scale of the publicly available data. We will revise existing mule deer habitat suitability equations created by TNC and NDOW as a starting point. TNC's current landscape model of mule deer habitat suitability contains: (i) five Resource Selection Functions (RSFs; mathematical relationship between environmental variables and habitat quality) for summer habitat; (ii) four RSFs for winter habitat; (iii) one RSF for the topography; and (iv) one RSF to measure the distance of traditional migratory corridor from human barriers such as mining operations or busy roads. A formula combines these elements by considering the contribution of each component, but also weights overall habitat suitability toward low-valued component. Keeping this general framework, we will reconsider the relationships among static variables (e.g., elevation, topography) and more dynamic vegetation and migratory barrier variables. Additionally, we will revisit the shape of curves we used for each RSF to adapt to the map resolution. We will hold a one day workshop to improve the RSFs with expert participants from organizations such as NDOW, University of Nevada, Reno, BLM, and Forest Service. We will question the experts about mule deer habitat use across each season to identify important variables and how relationship such as distance to important variables impact resource use.

The next task will be to generate the habitat suitability maps. Using the vegetation maps from the first task and the expert driven models from the second task, we will create a spatial map of habitat suitability for both study areas. These data layers will include the individual RSFs and seasonal and overall habitat suitability maps. The habitat suitability maps will be estimated using vegetation pre- and post-fires from 2016 and 2017. This comparison will allow managers to more fully understand the impacts of the fires on mule deer seasonal habitat. These will be used to generate priority maps within the burned areas to identify where restoration actions would be most cost-effective and most likely to succeed.

The final task will be writing a report which details the methods used in this project. The goal is to create a document that can serve as a manual on how NDOW staff can repeat the process for new areas of concern efficiently for future planning purposes.

#### **4. Permitting**

No permits are required for this work.

#### **5. Futures phases**

Using the proposed work as a template, new habitat suitability maps for different project areas could be generated as needed or funding becomes available. NDOW would like a statewide habitat suitability map to more finely identify important areas and prioritize resources for mule deer across the state. Funding sources could be Nevada Department of Wildlife Heritage Program and the USFWS Wildlife and Sport Fish Restoration Program (WSFR).

## **6. Principals**

The Nature Conservancy: Dr. Kevin Badik and Dr. Louis Provencher  
Nevada Division of Wildlife: Cody Schroeder

## **7. Number of staff involved**

The Nature Conservancy: 4 part-time  
Nevada Division of Wildlife: 1 part-time

## **8. Number of volunteers involved**

No volunteers are anticipated.

## **9. Time Line**

Milestone 1: Vegetation map of project area-1/2018

Milestone 2: Completion of Mule Deer Resource Selection Function Workshop-2/2018

Milestone 3: Finalized Habitat Suitability Maps-6/2018

Milestone 4: Report-9/2018

The most likely delay would come from the workshop as coordinating the schedule for the needed mule deer experts could be difficult given length of time needed and nature of the experts' employment.

## **10. Success**

One measure of success will be the completion of the priority restoration map, which can be used to inform land managers on both public and private lands where mule deer habitat improvement projects should be sited, especially as related to new fires. Secondly, the report will provide NDOW staff with a manual on how to replicate the process for other important mule deer areas within the state. Additionally, this methodology could be used for other species of management concerns but where data are lacking.

## 11. Grant Match

Match amount to be provided:	\$6,674.89	
Match details:	Please provide the form of your matching funds. If match is made up of both cash and in-kind, fill in both sections	
	Match is:	
	Cash	\$4,094.09
	In-kind	\$2,580.80
	For the cash portion of your match, is the funding already being held by the applicant for this project? No	
Description of matching funds/in-kind donations:	TNC and NDOW have a verbal agreement that NDOW will provide the matching cash if this proposal is accepted. The in-kind match is from the participation of NDOW employees. In particular, Cody Schroeder, state mule deer biologist, will be heavily involved in the habitat suitability equation creation, the workshop, and writing of the report (In-kind amount is \$1,860.80). And addition \$720 in-kind will be from the participation of at least two other NDOW employees in the workshop.	

## 12. Project Budget

Budget Item Description	Original Project Budget			Total	Expenditure to date DT	Expenditure to date (other sources)
	DT \$	Other Funding Name	Match \$			
Labor-paid						
a) LANDFIRE & geodata map translation	\$8,210.44	NDOW	\$1,259.16	\$9,469.60	\$0.00	\$0.00
b) Mule deer habitat suitability modeling & workshop	\$6,358.63	NDOW	\$2,811.64	\$9,170.28	\$0.00	\$0.00
c) Final report	\$7,080.30	NDOW	\$1,830.16	\$8,910.46	\$0.00	\$0.00
Travel, supplies, Equipment	\$0.00					
Indirect Cost Recovery (23.31%)	\$5,046.47		\$773.93	\$5,820.40	\$0.00	\$0.00
<b>TOTAL</b>	<b>\$26,695.85</b>		<b>\$6,674.89</b>	<b>\$33,370.74</b>	<b>\$0.00</b>	<b>\$0.00</b>

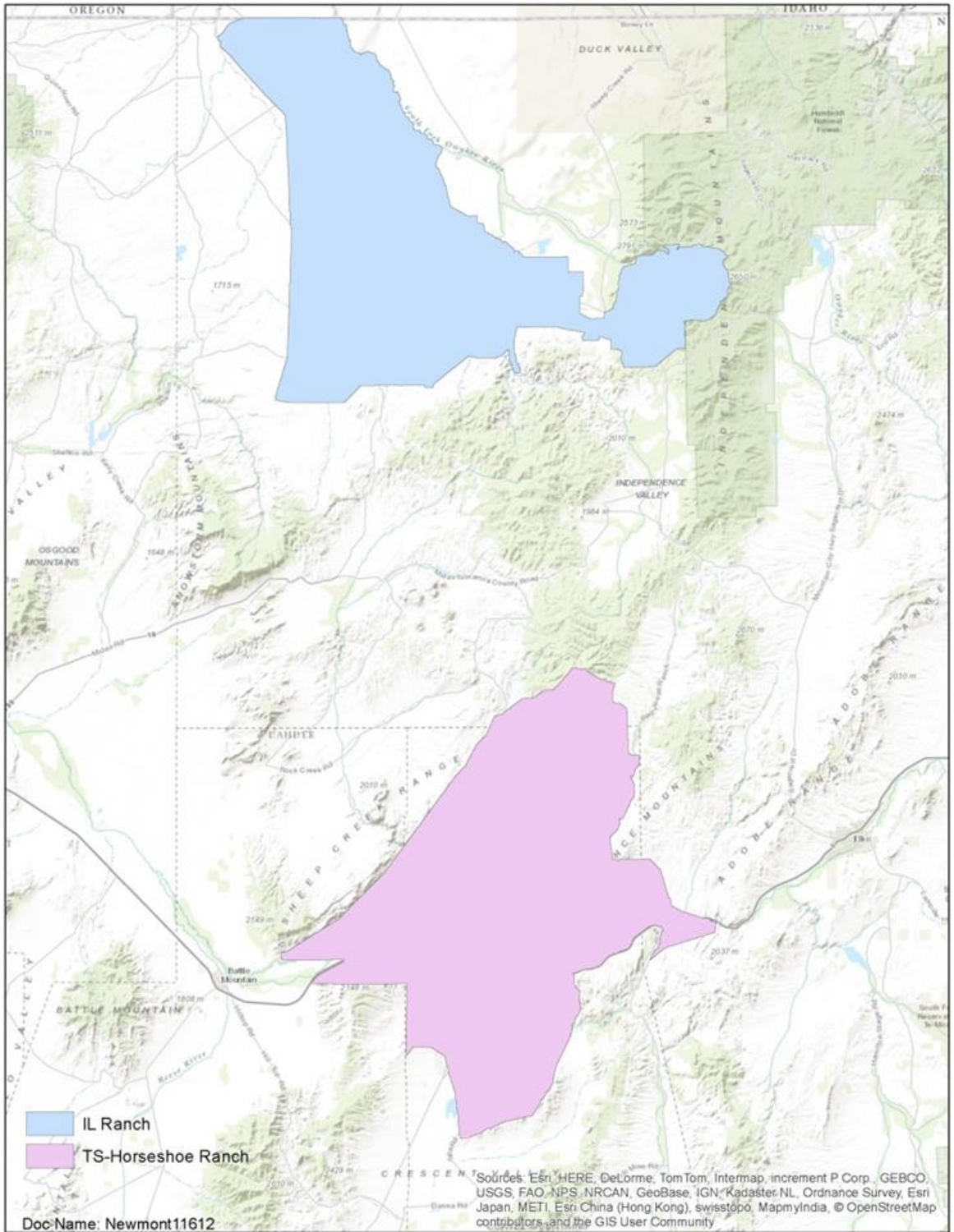


Figure 1. The IL and TS-Horseshoe Ranches Project Areas in northern Nevada.