Paperwork Reduction Act Statement. We are collecting this information in accordance with [Catalog of Federal Domestic Assistance (CFDA) Number: 15.655]. Your response is required to obtain or retain a benefit. We will use the information you provide to conduct a review and select projects for funding. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number. We estimate that it will take applicants under this program about ten hours to complete an application. We estimate it will take recipients under this program about ten hours to complete required reporting and ten hours for required recordkeeping. All burden estimates include the time to review instructions, search existing data resources, gather data needed and complete and review the submission. You may send comments on the burden estimate or any other aspect of this information collection to the Information Collection Clearance Officer, U.S. Fish and Wildlife Service, MS BPHC, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

U.S. Fish and Wildlife Service
Southwest Region Migratory Bird Program

Migratory Bird Monitoring, Assessment and Conservation
Catalog of Federal Domestic Assistance (CFDA) Number: 15.655

Notice of Funding Opportunity

I. Description of Funding Opportunity

Wetland habitats and their unique diversity of communities are being lost at an alarming rate (Noss et al. 1995, Semlitsch and Bodie 1998, Detenbeck et al. 1999, Angeler and Garcia 2005). Due to these losses, biodiversity and ecosystem functions are compromised (Angeler and Garcia 2005), especially in semiarid and arid regions where remaining wetlands are small and scattered (Angeler and Garcia 2005). Wetlands are ecologically important and their value for fish and wildlife populations are well known. Wetlands support extensive food webs, abundant biodiversity, and play a major role in providing unique habitats for a wide variety of flora and fauna (Mitsch and Gosselink 1993). They can be highly productive, exhibit fast rates of succession, and maintain high biological biomass (Lugo 1995). Since wetlands exhibit large variance in structural, functional, and hydrological function, they cannot be characterized simply, which limits the usefulness of generalized management to common wetland related problems (Euliss et al. 2004). This highlights the need for guided management recommendations specific to independent wetland ecosystems (Lugo 1995).

The goals of managing wetlands, either passive or intensive, are typically achieved using moist-soil management techniques (Rundle and Fredrickson 1981). These managed wetlands are normally impounded by levees with control structures allowing manipulation of hydrology. In moist-soil units, wetlands are generally drained during spring or summer to promote growth and seed production of annual hydrophytes. These units are re-flooded during autumn (Rundle and Fredrickson 1981, Lane and Jensen 1999) and winter to promote seed, tuber, and invertebrate production which provides food resources to wetland dependent species such as waterfowl, shorebirds, and wading birds (Fredrickson and Taylor 1982, Hakous and Smith 1993, Baldassarre and Bolen 1994, Duffy and LaBar 1994, Gray et al. 1999, Anderson and Smith 1999, Anderson and Smith 2000). Moist-soil management techniques provide a mechanism for enhancement of established wetlands, restoration of former wetlands, and creation of new wetland habitats (Lane and Jensen 1999). As such, monitoring moist-soil managed wetlands is

essential to determine whether such created ecosystems truly serve similar functions as natural wetlands.

The Bosque del Apache National Wildlife Refuge in central New Mexico is one such managed wetland complex. The goals of the refuge are to provide a critical stopover site for migrating waterfowl. The refuge serves as a wintering area for thousands of ducks, geese, sandhill cranes, and shorebirds each year. The refuge uses various water control features, such as gates and dams, to flood and drawdown wetland units on seasonal rotations. Moist soil impoundments are created by lowering water levels in marshes which promotes growth of marsh plants. Moist soil management is rotated across units such that heterogeneous arrays of habitats are always available. When units are dry, impoundments are mowed, disked, or burned, then re-flooded, allowing wetland obligate vegetation to grow. When desired wetland conditions have been created, the process is repeated. Wetland plants providing food to wildlife as a result from the fore mentioned management practices include smartweed, millets, chufa, bulrush, and sedges.

Anecdotal observations by refuge staff have reported an increasing density of knotgrass, *Paspalum distichum,* in certain wetland units. This genus in known to be invasive in wetlands and may displace desirable vegetation if not managed (USDA 2015). Species in the genus, such as *P. vaginatum*, can reduce native biodiversity and ecosystem function in wetlands (Riefner and Columbus 2008). However, the genus is also known to provide a viable food source to ducks, geese, swans, and other water birds (UF CAIP 2015). The effects of *P. distichum* encroachment in wetlands at Bosque del Apache National Wildlife Refuge are unknown. The goal of this project is to determine if productivity, in terms of seed and invertebrate production, in paspalum dominated wetlands benefits or reduces use by wetland avifauna of managed units. Additionally, we hope to determine which, if any, management practices may facilitate the spread of paspalum.

Authorizations: Fish and Wildlife Act of 1956, as amended, 16 U.S.C. 742a-754; Fish and Wildlife Coordination Act of 1958, 16 U.S.C. 661-667(e); Fish and Wildlife Conservation Act, 16 U.S.C. 2901-2911; Migratory Bird Treaty Act, 16 U.S.C. 709a.

The U.S. Fish and Wildlife Service (Service) uses a science-based, adaptive framework for setting and achieving broad-scale conservation objectives that strategically address the problems fish and wildlife will face in the future. This framework, called Strategic Habitat Conservation, is based on the principles of adaptive management and uses population and habitat data, ecological models, and focused monitoring and assessment efforts to develop and implement strategies that result in measurable fish and wildlife population outcomes. This process uses the best available scientific information to predict how fish and wildlife populations will respond to changes in the environment, thus enabling the Service to focus habitat conservation and other management activities where they will be most effective. In addition, the Service needs focused, applied science directed at high impact questions surrounding threats to fish and wildlife resources for which management and/or mitigation is required to maintain species at healthy, sustainable, desired levels. The Service must base its decisions on the best science available, in order to defend its regulatory decisions, biological opinions and species conservation recommendations to land managers.

II. Award Information

This program will use a cooperative agreement as the financial assistance instrument. The Service will be responsible for the following: (1) Provide assistance with analyzing data on identified locations in New Mexico; (2) Provide logistical support (e.g., expert opinion, manuscript review) for Recipient personnel; (3) Prioritize areas to be surveyed and help with data collection; (4) serve on graduate student committee. There is only ONE expected award and the estimated total program funding is $10,005.

III. Basic Eligibility Requirements

Eligible Applicants:

This Single Source Award is being awarded in accordance with Department of the Interior (DOI) Policy 505 DM 2.14 B(1) Unsolicited Proposal: The recipient, Borderlands Research Institute (BRI) – Sul Ross State University is uniquely qualified to perform the "Determining the effects of management on paspalum and its relationship to food production for avifauna" due to their location in the heart of the Chihuahuan Desert, availability of multiple data sets, current research topics, additional funding sources, and having expertise within their program. BRI also has the expertise to organize and coordinate the work duties of the project due to proximity and track record working with the U.S. Fish and Wildlife Service Region 2 Migratory Bird Program.

U.S. non-profit, non-governmental organizations must provide a copy of their Section 501(c)(3) or (4) status determination letter received from the Internal Revenue Service.

Federal law mandates that all entities applying for Federal financial assistance must have a valid Dun & Bradstreet Data Universal Number System (DUNS) number and have a current registration in the System for Award Management (SAM). See Title 2 of the Code of Federal Regulations (CFR), Part 25 for more information. Exemptions: The SAM registration requirement does not apply to individuals submitting an application on their own behalf and not on behalf of a company or other for-profit entity, state, local or Tribal government, academia or other type of organization.

A. DUNS Registration

Request a DUNS number at http://fedgov.dnb.com/webform. For technical difficulties, contact Dun & Bradstreet by email at: govt@dnb.com, or by calling the Government Customer Resource Center at voice phone: 866-705-5711 or TTY line: 877-807-1679 (hearing impaired customers only). Once assigned a DUNS number, entities are responsible for maintaining up-to-date information with Dun & Bradstreet.

B. Entity Registration in SAM

Register in SAM at www.sam.gov. Once registered in SAM, entities must renew and revalidate their SAM registration at least every 12 months from the date previously registered. Entities are strongly urged to revalidate their registration as often as needed to ensure that their information is up to date and in synch with changes that may have been made to DUNS and IRS information. Foreign entities who wish to be paid directly to a United States bank account must enter and maintain valid and current banking information in SAM.

Note: The official U.S. government website address for SAM is www.sam.gov. There is NO COST to register in or access SAM.gov. There are third-party vendors who charge a fee in exchange for registering entities in SAM; please be aware that you can register to do business with the U.S. government FOR FREE directly in SAM at www.sam.gov.

C. Excluded Entities

Applicant entities or their key project personnel identified in the SAM.gov Exclusions database as ineligible, prohibited/restricted or excluded from receiving Federal contracts, certain subcontracts, and certain Federal assistance and benefits will not be considered for Federal funding, as applicable to the funding being requested under this Federal program. The Service conducts a review of the SAM.gov Exclusions database for all applicant entities and their key project personnel prior to award.

D. Cost Sharing or Matching:

No cost sharing or matching is required

IV. Application Requirements

To be considered for funding under this funding opportunity, an application must contain:

A. A completed, signed and dated Application for Federal Assistance form. Do not include other Federal sources of funding, requested or approved, in the total entered in the "Federal" funding box on the Application for Federal Assistance form. Enter only the amount being requested under this program in the "Federal" funding box. Include any other Federal sources of funding in the total funding entered in the "Other" box.

B. Project Summary

Project Title: *DETERMINING THE EFFECTS OF MANAGEMENT ON PASPALUM AND ITS RELATIONSHIP TO FOOD PRODUCTION FOR AVIFAUNA*, Project Location: Socorro County, New Mexico. Summary / Narrative: Wetland habitats and their unique diversity of communities are being lost at an alarming rate (Noss et al. 1995, Semlitsch and Bodie 1998, Detenbeck et al. 1999, Angeler and Garcia 2005). Due to these losses, biodiversity and ecosystem functions are compromised (Angeler and Garcia 2005), especially in semiarid and arid regions where remaining wetlands are small and scattered (Angeler and Garcia 2005). Wetlands are ecologically important and their value for fish and wildlife populations are well known. Wetlands support extensive food webs, abundant biodiversity, and play a major role in providing unique habitats for a wide variety of flora and fauna (Mitsch and Gosselink 1993). They can be highly productive, exhibit fast rates of succession, and maintain high biological biomass (Lugo 1995). Since wetlands exhibit large variance in structural, functional, and hydrological function, they cannot be characterized simply, which limits the usefulness of generalized management to common wetland related problems (Euliss et al. 2004). This highlights the need for guided management recommendations specific to independent wetland ecosystems (Lugo 1995).

The goals of managing wetlands, either passive or intensive, are typically achieved using moist-soil management techniques (Rundle and Fredrickson 1981). These managed wetlands are normally impounded by levees with control structures allowing manipulation of hydrology. In moist-soil units, wetlands are generally drained during spring or summer to

promote growth and seed production of annual hydrophytes. These units are re-flooded during autumn (Rundle and Fredrickson 1981, Lane and Jensen 1999) and winter to promote seed, tuber, and invertebrate production which provides food resources to wetland dependent species such as waterfowl, shorebirds, and wading birds (Fredrickson and Taylor 1982, Hakous and Smith 1993, Baldassarre and Bolen 1994, Duffy and LaBar 1994, Gray et al. 1999, Anderson and Smith 1999, Anderson and Smith 2000). Moist-soil management techniques provide a mechanism for enhancement of established wetlands, restoration of former wetlands, and creation of new wetland habitats (Lane and Jensen 1999). As such, monitoring moist-soil managed wetlands is essential to determine whether such created ecosystems truly serve similar functions as natural wetlands.

The Bosque del Apache National Wildlife Refuge in central New Mexico is one such managed wetland complex. The goals of the refuge are to provide a critical stopover site for migrating waterfowl. The refuge serves as a wintering area for thousands of ducks, geese, sandhill cranes, and shorebirds each year. The refuge uses various water control features, such as gates and dams, to flood and drawdown wetland units on seasonal rotations. Moist soil impoundments are created by lowering water levels in marshes which promotes growth of marsh plants. Moist soil management is rotated across units such that heterogeneous arrays of habitats are always available. When units are dry, impoundments are mowed, disked, or burned, then re-flooded, allowing wetland obligate vegetation to grow. When desired wetland conditions have been created, the process is repeated. Wetland plants providing food to wildlife as a result from the fore mentioned management practices include smartweed, millets, chufa, bulrush, and sedges.

Anecdotal observations by refuge staff have reported an increasing density of knotgrass, *Paspalum distichum,* in certain wetland units. This genus in known to be invasive in wetlands and may displace desirable vegetation if not managed (USDA 2015). Species in the genus, such as *P. vaginatum*, can reduce native biodiversity and ecosystem function in wetlands (Riefner and Columbus 2008). However, the genus is also known to provide a viable food source to ducks, geese, swans, and other water birds (UF CAIP 2015). The effects of *P. distichum* encroachment in wetlands at Bosque del Apache National Wildlife Refuge are unknown. The goal of this project is to determine if productivity, in terms of seed and invertebrate production, in paspalum dominated wetlands benefits or reduces use by wetland avifauna of managed units. Additionally, we hope to determine which, if any, management practices may facilitate the spread of paspalum.

2. Project Goals and Objectives:

Objectives of this project are to:

1. Estimate the energetic production value (seed and invertebrate) of paspalum dominated wetlands.
2. Determine if different management practices influence paspalum propagation to varying degrees in wetlands.
3. Record use of paspalum dominated wetlands by avifauna in terms of bird abundance, diversity, and timing of utilization.

4. **Project Activities, Methods and Timetable:**

Sampling Time Frame

We anticipate collecting core samples and bird abundance data during November 2015, February 2016, and November 2016. We selected the dates based on eBird bird abundance totals indicating these months to have the greatest abundances of snow geese (*Chen caerulescens*), northern pintails (*Anas acuta*), Sandhill cranes (*Grus Canadensis*), avocets (*Recurvirostra americana*), and ibis (*Plegadis spp.*) on the Bosque Del Apache refuge. We selected these species because we feel they gave good representation of the guilds of birds commonly expected to make use of wetland units at the refuge.

Objective 1

Determining paspalum dominance.—Paspalum dominance within a wetland will be determined using a 1 m by 1m quadrat placed at 5 random locations within each wetland unit. Within each quadrat the relative composition of vegetation will be recorded as the basal cover of each plant species within the quadrat. The mean basal coverage of each plant species in a wetland unit will be calculated as:

$$Y_{ik} = \frac{x_{ik1} + x_{ik2} + x_{ik3} + x_{ik4} + x_{ik5}}{5}$$

Where: Y_{ik} = mean basal cover of plant species i in wetland unit k
x_{ik1} = basal cover of plant species i in wetland k in quadrat 1
x_{ik2} = basal cover of plant species i in wetland k in quadrat 2
x_{ik3} = basal cover of plant species i in wetland k in quadrat 3
x_{ik4} = basal cover of plant species i in wetland k in quadrat 4
x_{ik5} = basal cover of plant species i in wetland k in quadrat 5

Of the plant species recorded in wetland k, if basal coverage of paspalum in greater than each other species, that unit will be designated as 'paspalum dominant'.

Estimating energetic production.—To estimate the energetic production value of seeds and invertebrates contained within paspalum dominated wetlands, we will take 5 core samples from random locations within each paspalum dominated wetland. Random locations will be generated using ArcGIS (Version 10, ESRI, Redlands, California). Core samples will be taken using a 10 cm diameter sampler inserted vertically through the water column and pushed 10 cm into the sediment. Core samples will stored in a 10% solution of formalin. The formalin will be stained using Rose Bengal at approximately 1 gram of stain to 10 liters of formalin. Addition of stain helps identify invertebrates. Upon return to Sul Ross State University, core samples will be rinsed through three sieves (sieve sizes 5/8 [16 mm], 18 [1 mm], and 35 [500 μm]) to partition material by size and remove excess mud. All seeds and invertebrates will be picked from samples using a 20x Fisher Scientific microscope. Seeds and invertebrates will be dried in a Fisher Scientific Isotemp Incubator for 48 hours at 60℃ to constant mass. Dried samples will be weighed to ±0.0001 grams using a Mettler AC100 scale. Total seed and invertebrate biomass will be estimated for each wetland unit by first estimating the mean biomass of the 5 core samples:

$$Y_k = \frac{x_{k1} + x_{k2} + x_{k3} + x_{k4} + x_{k5}}{5}$$

Where: Y_{ik} = mean biomass of seeds/invertebrates in wetland unit k
x_{k1} = biomass of seeds/invertebrates in core sample 1 in wetland k
x_{k2} = biomass of seeds/invertebrates in core sample 2 in wetland k
x_{k3} = biomass of seeds/invertebrates in core sample 3 in wetland k
x_{k4} = biomass of seeds/invertebrates in core sample 4 in wetland k
x_{k5} = biomass of seeds/invertebrates in core sample 5 in wetland k

Mean biomass of seeds and invertebrates from the core samples will then be extrapolated to determine per acre production. For example: if the estimated mean seed biomass from the random core samples is 1.2345 grams, estimated seed biomass production for that wetland is calculated as:

If, $10\ cm = 0.0845\ acres$

Then, $\frac{1\ acre}{0.0845\ acres} = 11.83$

Therefore, $11.83 \times 1.2345 = 14.61\ kg/acre$

Objective 2

Model structure.—To determine if differing wetland management practices influence the production (seed and invertebrate) of paspalum stands, we will use linear mixed model regression to explore the relationship between management and paspalum production. Our efforts will focus on 5 key wetland management aspects:

1. Water depth – average water depth of the wetland during the flooding period.
2. Flooding duration – average number of days the wetland unit is inundated each year.
3. Flood initiation date – Julian date on which each unit reached 'full' inundation.
4. Drawdown initiation date – Julian date on which each unit is considered to have reached drawdown status.
5. Date of last disking – date on which each unit last had a mechanical treatment applied.

These variables will be entered into a linear mixed model regression model as predictor variables. In the models, estimated seed and invertebrate biomass production will be entered as the response variables. To control for the similarity of wetlands spaced in closer proximity to one another, wetlands will be individually numbered as a nominal categorical variable, and entered into the model as a random effect. To ensure there is no significant spatial autocorrelation between wetlands, we will plot residuals against predicted values and hope to see a random distribution of points within the scatter plot.

Because environmental data (such as biomass estimates) are commonly over-dispersed we will likely log-transform biomass estimates prior to analyses. Data are over-dispersed when the variance of the response variable is greater than its mean. To ensure that the log-transformation is appropriate for addressing over-dispersion in the data we will use the 'Explore' function in SPSS to estimate a dispersion parameter for each model. Dispersion parameter values

significantly below 1 indicate under-dispersed data, while values above 1 indicate over-dispersed data. Values close to 1 indicate little to no over- or –under-dispersion in the data.

We will use restricted maximum likelihood estimates (REML) in all models. In contrast to maximum likelihood estimation, REML provides better fit for mixed models and produces unbiased estimates of variance and covariance parameters (Laird and Ware, 1982; McLean et al., 1991; Fitzmaurice et al., 2004). In all models the covariance structure will be set as autoregressive 1 (AR1), which specifies homogenous variances and correlations that decline exponentially with temporal distance. The AR1 covariance structure assumes constant variability in each biomass measurement, and accounts for measurements which are temporally closer to each other being more correlated than replicates father apart. We will assess the assumption of constant variance by plotting model predicted values against residuals and looking for a random distribution of points within the scatter plot.

Generalized Model Validation.—A generalized cross-validation will be performed to determine if the models reasonably fit the data (Pineiro et al., 2008; Hoffman et al., 2010). To do this we will calculate the calibration slope of each model. Calibration represented the agreement between observed and predicted values of the response variable. The calibration slope evaluates the departure of the curve from a line with slope = 1. Models with good calibration have slope =1, whereas slopes of $x < 1 < x$ represent over- or underestimation of the predicted values (Pearce and Ferrier, 2000; Hoffman et al., 2010). Using the 'Curve Estimation' function in SPSS, we will regress the observed values against the model predicted values and fit 95% confidence intervals (CI's) to the curve. In these models observed values will be placed in the *y*-axis and predicted values in the *x*-axis (Pineiro et al., 2008). A reference line with slope =1 will be inserted with an intercept matching the intercept of the regression. If the reference line falls within the CI's of the regression line, this indicates the model fits the data sufficiently.

Estimating Variance in Production Explained by Models.—In each model the amount of variance in seed and invertebrate production explained by the model will be estimated by calculating marginal R^2 values for fixed effects (Edwards et al., 2008; Nakagawa & Schielzeth, 2013). R^2 values from mixed models can be derived in a number of ways, and hence lead to some questionability of their appropriateness (Kramer, 2005; Edwards et al., 2008). The R^2 values we will calculate measure multivariate association between the repeated measures and the model fixed effects. The R^2 value results from a 1:1 function of an appropriate F-statistic for testing fixed effects in a full model (Edwards et al., 2008). While maintaining the same covariance structure (AR1), the marginal R^2 statistic compares the full model with a null model with all fixed effects removed (Edwards et al., 2008; Nakagawa & Schielzeth, 2013). To estimate the amount of variance explained in the dependent variable by the fixed effects, we will determine statistical significance of raw correlations but report disattenuated correlations (Muchinsky 1996; Schauber et al. 2009). Disattenuated correlations adjust for the reduction in correlation coefficient magnitude due to sampling variability (Schauber et al. 2009). Disattenuated correlations remove the irreducible variance from the R^2 allowing interpretation of the fraction of explainable variance in the model. Observed correlations are disattenuated by:

$$R_{xy} = \frac{r_{xy}}{\sqrt{r_{xx}}}$$

where r_{xy} is the observed correlation between vectors x and y, and r_{xx} is the reliability of vector x. We will use a bootstrap method (using PopTools add-in Microsoft Excel) to estimate the reliability for each species. To do so, we will assume the observed productivity of seed and invertebrate biomass is the true estimate of biomass and variance. We then generate a random

sample (n = 1000) from the original data and calculate the variance of this random sample. The variance of the random sample (irreducible variance) is then subtracted from the total variance of the original model (i.e. calculated from fixed effects) to give the estimate of reliability (i.e. the fraction of explainable variance).

Objective 3

Although we will focus attention on snow geese, northern pintails, Sandhill cranes, Gambel's quail, and killdeer, we will collect data on all species of birds detected on wetlands. At each wetland we will count the number of bird species and their abundances during two daily observation periods. Observations will commence each day 30 minutes prior to sunrise and extended 1.5 hours after sunrise, and resume 1.5 hours before sunset and extend 30 minutes after sunset. During observation periods, every 15 minutes we will conduct a scan sample of the wetland. Observations will be made from tree-stands, ground blinds, or tripod-stands using binoculars and spotting scopes. To ensure accuracy and reduce the risk of double counts, the number of individuals of each bird species using the plots will be recorded into a Sony ICD-BX132 Digital Voice Recorder (Sony, New York, New York) and later transcribed onto a spreadsheet. Using a voice recorder allows observers to maintain continuous visual contact with the birds being surveyed without having to lift ones head to record data.

Counts from daily morning and afternoon scan samples during each observation period will be averaged using the 'Aggregate Data' function in SPSS (Version 22, IBM Corporation, Armonk, New York) to give an estimate of the daily bird abundance within each wetland. Data will be aggregated such that each resulting case represents the mean estimate of daily bird abundance for each species in each wetland. Days when a particular species is not observed will be recorded as 0, and all 0's will be included in analyses.

To ensure the use of paspalum dominated wetlands by birds is indeed the result of paspalum, we will collect samples of 5 individuals of each of the 5 focal species (snow geese, northern pintails, Sandhill cranes, Gambel's quail, and killdeer) in each collection season. Upon collection, we will insert an esophageal intubation to administer formalin to the crop and gizzard. Formalin will preserve invertebrate and seed sample within specimens until examination. At the end of each day of collection, crops and gizzards will be removed from specimens, dissected, and analyzed for the presence of paspalum.

D. Budget Form

Complete the Budget Information for Non-Construction Programs (SF 424A) or Budget Information for Construction Programs (SF 424C) form. Use the SF 424A if your project does not include construction and the SF 424C if the project includes construction or land acquisition. The budget forms are available on the Internet at http://www.grants.gov/web/grants/forms/sf-424-family.html#sortby=1. When developing your budget, keep in mind that financial assistance awards and subawards are subject to the Federal cost principles in Title 2 of the Code of Federal Regulations Part 200, as applicable to the recipient organization type. Links to the full text of the Federal cost principles are available on the Internet at http://www.ecfr.gov/.

Note on Multiple Federal Funding Sources: If the project budget includes multiple Federal funding sources, you must show the funds being requested from this Federal program on the budget form *separately* from any other requested/secured Federal sources of funding. Enter the funds being requested from this Federal program in the first row of the Budget Summary

section of the form, and then enter funding related to other Federal programs in the subsequent row(s). Be sure to enter each Federal program's CFDA number in the corresponding fields on the form. The CFDA number for this Federal program appears on the first page of this funding opportunity.

E. Budget Justification

In a separate narrative titled "**Budget Justification**", explain and justify all requested budget items/costs. Detail how the SF 424 Budget Object Class Category totals were determined and demonstrate a clear connection between costs and the proposed project activities. For personnel salary costs, include the base-line salary figures and the estimates of time (as percentages) to be directly charged to the project. Describe any item that under the applicable Federal cost principles requires the Service's approval and estimate its cost.

If Federally-funded equipment will be used for the project, provide a list of that equipment, including the Federal funding source.

Required Indirect Cost Statement: Recipients that do not have an approved indirect cost rate cannot charge indirect costs to their Federal award. All applicants except individuals applying for funds separate from a business or non-profit organization he/she may operate must include in the budget justification narrative one of the following statements and attach to their application any required documentation identified in the applicable statement:

"We are:

1. A U.S. state or local government entity receiving more than $35 million in direct Federal funding each year with an indirect cost rate of [insert rate]. We submit our indirect cost rate proposals to our cognizant agency. A copy of our most recently approved rate agreement/certification is attached.
2. A U.S. state or local government entity receiving less than $35 million in direct Federal funding with an indirect cost rate of [insert rate]. We are required to prepare and retain for audit an indirect cost rate proposal and related documentation to support those costs.
3. A [insert your organization type; U.S. states and local governments, please use one of the statements above or below] that has previously negotiated or currently has an approved indirect cost rate with our cognizant agency. Our indirect cost rate is [insert rate]. [Insert either: "A copy of our most recently approved but expired rate agreement is attached. In the event an award is made, we will submit an indirect cost rate proposal to our cognizant agency within 90 calendar days after the award is made." *or* "A copy of our current, approved rate agreement(s) is attached."]
4. A [insert your organization type] that has never submitted an indirect cost rate proposal to our cognizant agency. Our indirect cost rate is [insert rate]. In the event an award is made, we will submit an indirect cost rate proposal to our cognizant agency within 90 calendar days after the award is made.
5. A [insert your organization type] that has never submitted an indirect cost rate proposal to our cognizant agency and has an indirect cost rate that is lower than 10%.

Our indirect cost rate is [insert rate; must be lower than 10%]. However, in the event an award is made, we will not be able to meet the requirement to submit an indirect cost rate proposal to our cognizant agency within 90 calendar days after award. We request as a condition of award to charge a flat indirect cost rate of [insert rate; must be lower than 10%] of [insert a clear description of the direct cost base against which your rate is charged (e.g., salaries; salaries and fringe benefits; or modified total direct costs). However, please note that your organization cannot charge indirect costs in excess of the indirect costs that would be recovered if applied against modified total direct costs as defined in 2 CFR 220.68]. We understand that we must notify the Service in writing immediately if we establish an approved rate with our cognizant agency at any point during the award period.

6. A [insert your organization type] that has never submitted an indirect cost rate proposal to our cognizant agency and has an indirect cost rate that is 10% or higher. Our indirect cost rate is [insert your organization's indirect rate; must be 10% or higher]. However, in the event an award is made, we will not be able to meet the requirement to submit an indirect cost rate proposal to our cognizant agency within 90 calendar days after award. We request as a condition of award to charge a flat *de minimis* indirect cost rate of 10% of modified total direct costs as defined in 2 CFR 200.68. We understand that we must notify the Service in writing immediately if we do establish an approved rate with our cognizant agency at any point during the award period. We understand that additional Federal funds may not be available to support an unexpected increase in indirect costs during the project period and such changes are subject to review, negotiation, and prior approval by the Service.
7. A [insert your organization type] that is submitting this proposal for consideration under the [insert either "Cooperative Fish and Wildlife Research Unit Program" or "Cooperative Ecosystem Studies Unit Network"], which has a Department of the Interior-approved indirect cost rate cap of [insert program rate]. If we have an approved indirect cost rate with our cognizant agency, we understand that we must apply this reduced rate against the same direct cost base as identified in our approved indirect cost rate agreement. If we do not have an approved indirect cost rate with our cognizant agency, we understand that the basis for direct costs will be the modified total direct cost base defined in 2 CFR 200.68 "Modified Total Direct Cost (MTDC)". We understand that we must request prior approval from the Service to use the MTDC base instead of the base identified in our approved indirect cost rate agreement, and that Service approval of such a request will be based on: 1) a determination that our approved base is only a subset of the MTDC (such as salaries and wages); and 2) that use of the MTDC base will still result in a reduction of the total indirect costs to be charged to the award. In accordance with 2 CFR 200.405, we understand that indirect costs not recovered due to a voluntary reduction to our federally negotiated rate are not allowable for recovery via any other means.
8. A [insert your organization type] that will charge all costs directly.

All applicants are hereby notified of the following:

- Recipients without an approved indirect cost rate are prohibited from charging indirect costs to a Federal award. Accepting a flat *de minimis* rate as a condition of award is an approved rate.
- Failure to establish an approved rate during the award period renders all costs otherwise allocable as indirect costs unallowable under the award.
- Recipients may not charge to their Service award any indirect costs calculated against the portion of total direct project costs paid by any other Federal funding source or non-Federal partner.
- Recipients must have prior written approval from the Service to transfer unallowable indirect costs to amounts budgeted for direct costs or to satisfy cost-sharing or matching requirements under the award.
- Recipients are prohibited from shifting unallowable indirect costs to another Federal award unless specifically authorized to do so by legislation.

Applicants who are individuals applying for funds separate from a business or non-profit organization he/she may operate are not eligible to charge indirect costs to their award. If you are an individual applying for funding, do not include any indirect costs in your proposed budget.

For more information on indirect cost rates, see the Service's **Indirect Costs and Negotiated Indirect Cost Rate Agreements** guidance document on the Internet at https://www.fws.gov/grants/atc.html.

Negotiating an Indirect Cost Rate with the Department of the Interior: Entities that do not have a NICRA must first have an open, active Federal award before they can submit an indirect cost rate proposal to their cognizant agency. The Federal awarding agency that provides the largest amount of direct funding to your organization is your cognizant agency, unless otherwise assigned by the White House Office of Management and Budget (OMB). If the Department of the Interior is your cognizant agency, your indirect cost rate will be negotiated by the Interior Business Center (IBC). For more information, contact the IBC at:

Indirect Cost Services
Acquisition Services Directorate, Interior Business Center
U.S. Department of the Interior
650 Capitol Mall, Suite 7-400
Sacramento, CA 95814
Phone: 916-930-3803
Email: Through https://www.doi.gov/ibc/contactus/ibcfeedback web form
Internet address: https://www.doi.gov/ibc/services/finance/indirect-cost-services

F. Single Audit Reporting Statements: As required in Title 2 of the Code of Federal Regulations Part 200, Subpart F, all U.S. states, local governments, federally-recognized Indian tribal governments, and non-profit organizations expending $750,000 USD or more in Federal award funds in a fiscal year must submit a Single Audit report for that year through the Federal Audit Clearinghouse's Internet Data Entry System. All U.S. state, local

government, federally-recognized Indian tribal government and non-profit applicants must provide a statement regarding if your organization was/was not required to submit a Single Audit report for the organization's most recently closed fiscal year and, if so, state if that report is available on the Federal Audit Clearinghouse Single Audit Database website (https://harvester.census.gov/facweb/) and provide the EIN under which that report was submitted. Include these statements at the end of the Project Narrative in a section titled "**Single Audit Reporting Statements**".

G. Assurances: Include the appropriate signed and dated Assurances form available at http://www.grants.gov/web/grants/forms/sf-424-family.html#sortby=1. Use the **Assurances for Construction Programs (SF 424D)** for construction and land acquisition projects. Use the **Assurances for Non-Construction Programs (SF 424B)** for all other projects. The form includes a statement that some of the assurances may not be applicable to your organization and/or your project or program. Signing this form does not make you or your organization subject to laws that are otherwise not applicable to you or your organization. Changing, crossing out, or making notations on the form before signing has no impact on the applicability of law.

H. Certification and Disclosure of Lobbying Activities: Under Title 31 of the United States Code, Section 1352, an applicant or recipient must not use any federally appropriated funds (both annually appropriated and continuing appropriations) or matching funds under a grant or cooperative agreement award to pay any person for lobbying in connection with the award. Lobbying is defined as influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress connection with the award. Submission of an application also represents the applicant's certification of the statements in 43 CFR Part 18, Appendix A-Certification Regarding Lobbying. If you/your organization have/has made or agrees to make any payment using non-appropriated funds for lobbying in connection with this proposal AND the Federal share exceeds $100,000, complete and submit the **SF LLL, Disclosure of Lobbying Activities** form available at http://www.grants.gov/web/grants/forms/post-award-reporting-forms.html#sortby=1. See 43 CFR, Subpart 18.100 for more information on when additional submission of this form is required.

I. Conflict of Interest Disclosures: Applicants must notify the Service in writing of any actual or potential conflicts of interest that are known at the time of application or that may arise during the life of this award, in the event an award is made. Conflicts of interest include any relationship or matter which might place the recipient, the recipient's employees, or the recipient's subrecipients in a position of conflict, real or apparent, between their responsibilities under the award and any other outside interests. Conflicts of interest may also include, but are not limited to, direct or indirect financial interests, close personal relationships, positions of trust in outside organizations, consideration of future employment arrangements with a different organization, or decision-making affecting the award that would cause a reasonable person with knowledge of the relevant facts to question the impartiality of the applicant, the applicant's employees, or the applicant's future subrecipients in the matter. Applicants must notify the Service in writing in their application

if any key project personnel, including subrecipient and contractor personnel, are known to be related to, married to, or have a close personal relationship with any Federal employee in or associated with the program to which you are applying for funding or who otherwise may be involved in the review and selection of the application. Upon receipt of such a notice, the Service program, in consultation with their Ethics Counselor, will determine if a conflict of interest exists and, if so, if there are any possible actions to be taken by the applicant to reduce or resolve the conflict. Failure to disclose and resolve conflicts of interest in a manner that satisfies the Service may result in the project not being select for funding.

Application Checklist

- ☐ **Evidence of non-profit status**: If a non-profit organization, a copy of their Section 501(c)(3) or (4) status determination letter received from the Internal Revenue Service.
- ☐ **SF 424, Application for Federal Assistance**: A complete, signed and dated SF 424, SF 424-Mandatory, or SF 424-Individual form.
- ☐ **Project narrative**
- ☐ **Timetable**
- ☐ **Single Audit Reporting statement**: If a U.S. state, local government, federally-recognized Indian tribal government, or non-profit organization, statements regarding applicability of and compliance with Single Audit reporting requirements.
- ☐ **SF 424 budget form**: A complete SF 424A or SF 424C Budget Information form.
- ☐ **Budget justification**
- ☐ **Federally-funded equipment list**: If Federally-funded equipment will be used for the project, a list of that equipment.
- ☐ **Indirect cost statement**
- ☐ **NICRA**: When applicable, a copy of the organization's current Negotiated Indirect Cost Rate Agreement.
- ☐ **SF 424 Assurances form:** Signed and dated SF 424B or SF 424D Assurances form.
- ☐ **SF LLL form:** If applicable, completed SF-LLL Disclosure of Lobbying Activities form.
- ☐ **Conflict of Interest disclosure,** when applicable.

Failure to provide complete information may cause delays, postponement, or rejection of the application.

V. Submission Instructions
SUBMISSION DEADLINE: 22 October 2018

Intergovernmental Review: Before submitting an application, U.S. state and local government applicants should visit the following website (https://obamawhitehouse.archives.gov/omb/grants_spoc) to determine whether their application is subject to the state intergovernmental review process under Executive Order (E.O.) 12372 "Intergovernmental review of Federal Programs." E.O. 12372 was issued to foster the intergovernmental partnership and strengthen federalism by relying on state and local processes

for the coordination and review of proposed Federal financial assistance and direct Federal development. The E.O. allows each state to designate an entity to perform this function. The official list of designated entities is posted on the website. Contact your state's designated entity for more information on the process the state requires to be followed when applying for assistance. States that do not have a designated entity listed on the website have chosen not to participate in the review process.

Download the Application Package linked to this Funding Opportunity on Grants.gov to begin the application process. Downloading and saving the Application Package to your computer makes the required government-wide standard forms fillable and printable. Completed applications may be submitted by mail, by email, electronically through Grants.gov, or as otherwise described in the Grants.gov funding opportunity.

To submit an application through Grants.gov:
Go to the Grants.gov Apply for Grants page (http://www.grants.gov/web/grants/applicants/apply-for-grants.html) for an overview of the process to apply through Grants.gov. You/your organization must complete the Grants.gov registration process before submitting an application through Grants.gov. Registration can take between three to five business days, or as long as two weeks if all steps are not completed in a timely manner.

Important note on Grants.gov application attachment file names: Please do not assign application attachments file names longer than 20 characters, including spaces. Assigning file names longer than 20 characters will create issues in the automatic interface between Grants.gov and the Service's financial assistance management system.

VII. Award Administration
Award Notices: Following review, applicants may be requested to revise the project scope and/or budget before an award is made. Successful applicants will receive written notice in the form of a notice of award document. Notices of award are typically sent to recipients by e-mail. If e-mail notification is unsuccessful, the documents will be sent by courier mail (e.g., FedEx, DHL or UPS). Award recipients are not required to sign/return the Notice of Award document. Acceptance of an award is defined as starting work, drawing down funds, or accepting the award via electronic means. Awards are based on the application submitted to, and as approved by, the Service. The notice of award document will include instructions specific to each recipient on how to request payment. If applicable, the instructions will detail any additional information/forms required and where to submit payment requests.

Domestic Recipient Payments: Prior to award, the Service program office will contact you/your organization to either enroll in the U.S. Treasury's Automated Standard Application for Payments (ASAP) system or, if eligible, obtain approval from the Department of the Interior to be waived from using ASAP.

Transmittal of Sensitive Data: Recipients are responsible for ensuring any sensitive data being sent to the Service is protected during its transmission/delivery. The Service strongly recommends that recipients use the most secure transmission/delivery method available. The

Service recommends the following digital transmission methods: secure digital faxing; encrypted emails; emailing a password protected zipped/compressed file attachment in one email followed by the password in a second email; or emailing a zipped/compressed file attachment. The Service strongly encourages recipients sending sensitive data in paper copy to use a courier mail service. Recipients may also contact their Service Project Officer and provide any sensitive data over the telephone.

Award Terms and Conditions: Acceptance of a financial assistance award (i.e., grant or cooperative agreement) from the Service carries with it the responsibility to be aware of and comply with the terms and conditions applicable to the award. Acceptance is defined as the start of work, drawing down funds, or accepting the award via electronic means. Awards are based on the application submitted to and approved by the Service and are subject to the terms and conditions incorporated into the notice of award either by direct citation or by reference to the following: Federal regulations; program legislation or regulation; and special award terms and conditions. The Service's Standard Award Terms and Conditions are available on the Internet at https://www.fws.gov/grants/atc.html. If you do not have access to the Internet and require a full text copy of the award terms and conditions, contact the Service point of contact identified in the Agency Contacts section below.

Recipient Reporting Requirements:
Financial and Performance Reports:
Final Reports: Recipients are required to submit final financial and performance reports no later than 90 calendar days after the award period of performance end date or termination date, whichever comes first. For awards lasting 12 months or less, the final reports will be the only financial and performance reports required, except in unusual circumstances or if waived.

Interim Reports: For awards that last longer than 12 months, recipients are required to submit interim financial and performance reports no less frequently than annually and no more frequently than quarterly, except in unusual circumstances or if waived. Requiring a higher frequency of reporting than annual reporting will be based on the Service's assessment of higher or other unusual circumstance. Quarterly and semiannual interim reports are due within 30 calendar days of the reporting period end date. Annual interim reports are due within 90 calendar days of the reporting period end date.

Recipients must use the Standard Form 425, Federal Financial Report for financial reporting, available on the Internet at http://www.grants.gov/web/grants/forms/post-award-reporting-forms.html#sortby=1.

Performance reports must contain: 1) a comparison of actual accomplishments with the goals and objectives of the award as detailed in the approved scope of work; 2) a description of reasons why established goals were not met, if appropriate; and 3) any other pertinent information relevant to the project results.

Significant Developments Reports: Events may occur between the scheduled performance reporting dates that have significant impact upon the supported activity. In such cases, recipients

are required to notify the Service in writing as soon as the following types of conditions become known:

- Problems, delays, or adverse conditions that will materially impair the ability to meet the objective of the Federal award. This disclosure must include a statement of any corrective action(s) taken or contemplated, and any assistance needed to resolve the situation.
- Favorable developments that enable meeting time schedules and objectives sooner or at less cost than anticipated or producing more or different beneficial results than originally planned.

The Service will specify in the notice of award document the reporting and reporting frequency applicable to the award.

Conflict of Interest Disclosures: Recipients are responsible for notifying the Service Project Officer in writing of any actual or potential conflicts of interest that may arise during the life of this award. Conflicts of interest include any relationship or matter which might place the recipient, the recipient's employees, or the recipient's subrecipients in a position of conflict, real or apparent, between their responsibilities under this award and any other outside interests. Conflicts of interest may also include, but are not limited to, direct or indirect financial interests, close personal relationships, positions of trust in outside organizations, consideration of future employment arrangements with a different organization, or decision-making affecting the award that would cause a reasonable person with knowledge of the relevant facts to question the impartiality of the Recipient, the Recipient's employees, or the Recipient's subrecipients in the matter. Upon receipt of such a notice, the Service Project Officer in consultation with their Ethics Counselor will determine if a conflict of interest exists and, if so, if there are any possible actions to be taken by the Recipient, the Recipient's employee(s), or the Recipient's Subrecipient(s) that could reduce or resolve the conflict. Failure to resolve conflicts of interest in a manner that satisfies the Service may result in any of the remedies described in 2 CFR 200.338, Remedies for Noncompliance, including termination of this award.

Other Mandatory Disclosures: The non-Federal entity or applicant for a Federal award must disclose, in a timely manner, in writing to the Federal awarding agency or pass-through entity all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Non-Federal entities that have received a Federal award including the term and condition outlined in 2 CFR 200, Appendix XII—Award Term and Condition for Recipient Integrity and Performance Matters are required to report certain civil, criminal, or administrative proceedings to SAM. Failure to make required disclosures can result in any of the remedies described in 2 CFR 200.338 Remedies for noncompliance, including suspension or debarment. (See also 2 CFR Part 180, 31 U.S.C. 3321, and 41 U.S.C. 2313.)

2 CFR Part 200, Appendix XII—Award Term and Condition for Recipient Integrity and Performance Matters is applicable to awards with a total Federal share of more than $500,000, except those to individuals and foreign public entities.

VIII. Agency Contacts

Technical Point of Contact:
Dan Collins, PhD
Migratory Bird Coordinator
USFWS-Region 2 Migratory Bird Office
P. O. Box 1306
Albuquerque, NM 87103
Office: (505) 248-6881
Cell: (505) 377-4517
Fax: (505) 248-6674

Administrative Point of Contact:
Sara Nicole Williams, Budget-Grants Analyst
U.S. Fish and Wildlife Service
Region 2 Migratory Bird Office
500 Gold Ave SW
Albuquerque, New Mexico 87102
Email: sara_n_williams@fws.gov
Phone: (505) 248-7462