



**U.S. Fish and Wildlife Service**

# Decision and Finding of No Significant Impact

For Issuing Depredation, Scientific Collection, and Special Purpose  
Permits for Common Raven in Nevada

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## **Introduction**

The United States Fish and Wildlife Service (hereafter, Service) makes decisions on depredation, scientific collection, and special purpose permit applications pursuant to 50 C.F.R. § 21.100, 21.73, and 21.95, respectively, for the annual take (i.e. lethal removal) of common ravens (*Corvus corax*; hereafter, "raven"), in the State of Nevada. In July 2020, United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services in Nevada (WS-Nevada) issued a final Environmental Assessment for Predator Damage Management in Nevada (USDA 2020). The EA included an assessment of the impact of removing ravens in Nevada. Pursuant to the National Environmental Policy Act (NEPA) (42 U.S.C 4321 et seq.), the Service was a cooperating agency (40 CFR 1501.6) in the preparation of the EA, however, we were not able to adopt the NEPA analysis. The Service has prepared our own EA to assess the impacts of increasing annual permitted take of ravens in the state of Nevada and considered three alternatives: the reduced take alternative for 11,000 ravens, the potential lethal take maximum alternative for 19,402 ravens, and the no action alternative of 5,000 ravens annually.

Issuance of a permit by the Service for take (pursuant to 50 C.F.R. § 21.100, 21.73, and 21.95) constitutes a discretionary Federal action that is subject to the National Environmental Policy Act (NEPA; 42 United States Code [U.S.C.] §§ 4321–4347). We intend to adopt the EA to support our permit decisions for depredation permit applications for the annual take of up to 19,042 ravens in the State of Nevada.

The scope of this proposed action and the preferred alternative is limited to applications for depredation, scientific collection, and special purpose permits for ravens in Nevada to alleviate human health and safety concerns, protect sensitive wildlife, protect livestock, and reduce damage to property. The USFWS may also issue permits to take ravens if there is convincing evidence that ravens are adversely affecting species of high conservation concern or rare and declining plant communities at a local scale.

## **Proposed Action and Alternatives Considered**

In the EA, the Service fully analyzed three potential courses of action, summarized below, to address the impacts of increasing the total number of ravens.

### Alternative 1: Reduced Take Alternative (Proposed Action)

Under the reduced take alternative, the Service would permit the take of up to 11,000 ravens annually in Nevada through depredation, scientific collection, and special purpose permits. This is nearly double the number that is currently permitted and 1,000 more than quantity analyzed in USDA 2020.

### Alternative 2: Potential Lethal Take Maximum Alternative (Selected Action)

WS-Nevada and the Service used a potential take limit model to determine how many ravens could be lethally removed from Nevada without causing an overall decrease to the population. This analysis determined that 19,042 ravens could be taken annually through permits issued to WS-Nevada, Nevada Department of Wildlife, and landowners. Based on reports from previous years, the majority of take would support the protection of greater sage-grouse.

### Alternative 3: No Action

Under the No-Action Alternative, the Service would take no further action to increase the total number of ravens permitted annually in Nevada despite the growing need expressed to us by applicants and in the comments we received on the draft EA. This alternative would keep the cumulative take at 5,000.

## **Public Comment and Tribal Coordination**

In 2024, the Service sent a copy of the draft EA to all federally recognized tribes in Nevada and asked for any comments. No responses were received from any of the tribes. On January 24, 2024, the Service made a draft of the EA available for public comments for 30 days. We received 11 responses and replied to them in our updated and final EA. The most frequent concerns included supporting the maximum take alternative, requesting that the Service use more recent data with larger numbers of ravens to re-model and re-evaluate the potential maximum take limit, and requesting a raven population plan that specifically benefits greater sage-grouse.

## **Selected Alternative**

Based on review of the analyses detailed in the EA and the comments we received, the Service selected the Potential Lethal Take Maximum Alternative (Alternative 2) for the proposed action of issuing permits for the take of up to 19,042 ravens annually in the state of Nevada. Take of ravens would occur in all alternatives, however this alternative incorporates the prescribed take level analysis to impact their population growth without decreasing the overall raven population. This option addresses multiple concerns made in the public comments more fully than the other two options analyzed in the EA.

## **Significance Criteria**

Regulations of the NEPA define significance criteria for consideration by federal agencies (40 CFR § 1508.27). Below we examine these criteria for the Selected Alternative.

## Context

NEPA requires consideration of the significance of an action in several contexts, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant in accordance with 40 CFR 1508.27(a). For purposes of analyzing the Selected Action, the appropriate context for potential impacts associated with the Selected Action is local and statewide, because the Selected Action does not affect national resource values. The context of the Selected Alternative points to no significant environmental impact considering the following (as discussed in the EA):

- Raven populations in the western United States have been increasing since 1966 due to an increase of humans in the landscape. Telephone poles and food subsidies, for example, act as attractants that draw ravens into areas where they either had not used before or in larger densities than they existed historically. This increase in raven population has an increasingly greater impact on sensitive species such as greater sage-grouse and desert tortoise as well as to livestock and agriculture. Increasing the permitted take would help alleviate the impacts the growing number of ravens has on the landscape.
- Authorizing raven take in Nevada up to the potential take maximum is a conservative number as the analysis was run on 2013 Partners in Flight data that estimated the population in the state to be 190,000. 2019 data show an increase to 370,000 and so even selecting the maximum take the total population of ravens will only likely slow population growth and not decrease the overall population.
- Each permit application will continue to be analyzed at an individual basis based on the different needs identified in the EA. Applications will be reviewed to ensure they meet issuance criteria for either depredation (50 C.F.R. § 21.100), scientific collection (50 C.F.R. § 21.73), or special purpose (50 C.F.R. § 21.95).

## **Finding of No Significant Impact**

The Service's Migratory Bird Program concludes from the analysis conducted in the EA and the information provided above that the Selected Action would not trigger significant impacts on the environment based on criteria established by regulations, policy, and analysis. Analyses of impacts were conducted at the Project, local, and statewide scales, and direct, indirect, and cumulative effects were assessed. The Selected Action is unlikely to have significant impacts on ravens because while it represents the maximum take in the state of Nevada based on 2013 data, the population continues to grow and the impact on sensitive species continues to increase every year.

Based on the findings discussed herein, we conclude that the Selected Action is not a major Federal action and will result in no significant impacts to the environment, individually or cumulatively with other actions in the general area. This determination is based on the rationale that the significance criteria, as defined by the CEQ (40 CFR § 1508.27), have not been met. "Significantly" as used in NEPA requires considerations of both context and intensity. No environmental effects meet the definition of significance in context or intensity as defined in 40

CFR § 1508.27. Therefore, preparation of an EIS to further analyze possible effects is not required pursuant to Section 102(2)(c) of NEPA, and our environmental review under NEPA is concluded with this finding of no significant impact.

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

## References

- 40 Code of Federal Regulations (CFR) § 1501.6. Title 40 – Protection of Environment; Chapter V – Council on Environmental Quality; Subchapter A – National Environmental Policy Act Implementing Regulations; Part 1501 – NEPA and agency planning; Section (§)1501.6 – Findings of No Significant Impact. Available online: <https://www.ecfr.gov>.
- 40 Code of Federal Regulations (CFR) § 1508.27. Title 40 - Protection of Environment; Chapter V - Council on Environmental Quality; Part 1508 - Terminology and Index; Section (§) 1508.27 - Significantly. Available online: <https://www.ecfr.gov>
- 42 United States Code (U.S.C.) §§ 4321-4347. Title 42 - the Public Health and Welfare; Chapter 55 - National Environmental Policy; Subchapters I (Policies and Goals) and II (Council on Environmental Quality); Sections (§§) 4321-4347. Available online: <http://uscode.house.gov>.
- 50 Code of Federal Regulations (CFR) § 21.100. Title 50 – Wildlife and Fisheries; Chapter I – United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 21 – Migratory Bird Permits; Subpart D – Provisions for Depredation, Overabundant, or otherwise Injurious Birds; Section (§) 21.100 – Depredation Permits. Available online: <https://www.ecfr.gov>
- 50 Code of Federal Regulations (CFR) § 21.73. Title 50 – Wildlife and Fisheries; Chapter I – United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 21 – Migratory Bird Permits; Subpart C – Specific Permit Conditions; Section (§)21.73 – Scientific collecting permits. Available online: <https://www.ecfr.gov>
- 50 Code of Federal Regulations (CFR) § 21.95. Title 50 – Wildlife and Fisheries; Chapter I – United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 21 – Migratory Bird Permits; Subpart C – Specific Permit Conditions; Section (§) 21.95 – Special purpose permits. Available online: <https://www.ecfr.gov>.
- [USDA] United States Department of Agriculture. 2020. Final Environmental Assessment Predator Damage Management in Nevada. Accessible at: <https://www.aphis.usda.gov/sites/default/files/nv-2020-pdm-final-ea.pdf>.

**Attachment A: Final Environmental Assessment:**  
**Depredation Permits for Common Raven Removal in Nevada**



U.S. Fish and Wildlife Service

# Environmental Assessment

## *Depredation Permits for Common Raven Removal in Nevada*

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## Contents

1.	Introduction .....	1
2.	Need for Action .....	1
3.	Background .....	3
3.1.	Raven Life History and Trends .....	3
3.2.	Raven Threats to Resources .....	3
4.	Alternatives .....	5
4.1.	Alternative 1: Reduced Take Alternative (Preferred Alternative): .....	5
4.2.	Alternative 2: Issue Permits for up to the Potential Lethal Take Maximum .....	5
4.3.	Maintain Permit at the Current Permitted Amount (No Action) .....	5
5.	Environmental Effects .....	6
5.1.	Population Analysis .....	6
5.2.	Alternative 1: Reduced Take Alternative .....	6
5.2.1.	Effect on Raven Populations .....	6
5.2.2.	Effects on other species .....	7
5.2.3.	Effects on Non-Target Migratory Birds .....	8
5.2.5.	Endangered Species Act Listed Species .....	9
5.2.6.	Other Effects .....	9
5.3.	Alternative 2: Authorize up to the Potential Lethal Take Maximum .....	10
5.3.1.	Effects on Raven Populations .....	10
5.3.2.	Effects on Sensitive Species .....	11
5.3.3.	Effects on Non-Target Species .....	11
5.4.	Alternative 3: Continue issuing permits up to presently authorized take limits (No Action) ....	11
5.4.1.	Effects on Ravens .....	11
5.4.2.	Effects on Sensitive Species .....	12
5.5.	Cumulative Effects .....	12
6.	Persons Consulted, Collaborators, and Stakeholders .....	13
7.	Literature Cited .....	28

## 1. Introduction

The United States Fish and Wildlife Service (Service) has prepared this Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA; 42 U.S.C. 421 et. seq.) for the purpose of evaluating the reasonably foreseeable environmental impacts of making permitting decisions on Common Raven (*Corvus corax*; raven) take in the state of Nevada. This concerns increasing the number of covered take of ravens primarily for the purpose of protecting livestock, agricultural resources, sensitive wildlife, and human health and safety. While this EA considers the potential environmental impacts of permitting actions, the Service will evaluate each permit application individually and make future decisions based on the criteria set forth in 50 C.F.R. §§ 21.100. (depredation), 21.73 (scientific collection), 21.95 (special purpose), and any future regulations that allow for lethal take. We are considering three alternatives described below: the maximum take option, reduced take alternative (the preferred alternative), and renewal of the most recent permits (no action).

## 2. Need for Action

Ravens have co-existed with other species in predator-prey relationships that evolved over tens of thousands of years. However, these relationships have been greatly disrupted by the accelerating pace of human-caused modifications to the North American landscape, and raven population trends are no longer solely dependent on historical ecological drivers. Ravens are remarkably adaptable and can easily exploit resources made available due to human modifications to the landscape including supplemental food and nesting structures. Consequently, raven populations in recent decades have followed a significantly increasing trend (Sauer et al. 2022). Supplemental food sources such as garbage, crops, and roadkill may give ravens an advantage over less opportunistic feeders and have allowed their populations to increase precipitously in some areas (Boarman 1999). Power poles and other towers can provide elevated perching and nesting locations in areas where these features were previously nonexistent or uncommon. With this increasing trend has come a rise in conflicts with at-risk species, conflicts with agriculture (e.g., livestock and nut producers), and risks to human health and safety (e.g., on utility lines and at airports).

The Migratory Bird Treaty Act (MBTA; 16 U.S.C. § 703-712) prohibits take of migratory bird species without a permit, including ravens. Issuance of an MBTA permit would authorize take of ravens if deemed necessary for the protection of other wildlife and their resources, livestock and agriculture resources, and human safety. Issuing a permit for take constitutes a discretionary Federal action by the Service that is subject to NEPA. The scope of this EA includes the issuance of permits for depredation, scientific collection, special purpose use, and any future regulations that allow for lethal take to take ravens.

The Service uses standard operating procedures developed by the Migratory Bird Permit Program in order to evaluate need for a take permit (See Appendix A). While developed for depredation activities, this guidance can be used for all lethal take. Take can be authorized for four types of damage: agricultural damage, private and public property damage, threats to human health and safety, and threats to the recovery of protected wildlife. The first step in the evaluation process is determining completeness of the application. Requirements include a description of damage, non-lethal method implementation and long-term solutions, species-specific take request, and a description of the method of take. Once an application is determined to be complete, it is reviewed for potential disqualifying factors. Some common examples of these factors are inability to demonstrate valid justification, lack of responsibility for the action, or authorization requests that threaten another wildlife or plant population. Following this, the reviewer evaluates the impact of take on species populations. If it is determined that the requested take will not have a significant impact on the population of the given species, which may be evaluated at the local, regional, or statewide scale, as appropriate, then the permit conditions are developed which list the authorized take, methods of take allowed, and other mandatory requirements such as reporting and disposal. The permit is issued once all of these steps have been completed.

In July 2020, United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services in Nevada (WS-Nevada) issued a final Environmental Assessment for Predator Damage Management in Nevada (USDA 2020). USDA 2020 included an assessment of the impact of raven removal on the raven population in Nevada. Pursuant to NEPA, the Service was a cooperating agency in the preparation of the EA. We incorporate USDA 2020 by reference in this EA to support our decisions for permit applications for the annual take (i.e., lethal removal) of ravens in the State of Nevada. As currently authorized by the MBTA, the Service may issue depredation, scientific collection, and special purpose permits. The Service receives applications for permits from WS-Nevada, the Nevada Department of Wildlife (NDOW), airports, agricultural producers, utilities, and other stakeholders affected by or studying ravens. Upon receipt of a properly executed application for a permit, the Service is required to make a determination and issue the appropriate permit unless one of the criteria under Issuance of Permits applies. The Service's purposes are to ensure that its permit decision is consistent with the MBTA, its underlying treaties, and implementing regulations as well as complies with other applicable Federal laws and regulations. The MBTA gives the Service broad authority to protect birds, but also to regulate their taking as long as their conservation is assured; the issuance of these permits must ensure that authorized take will not potentially threaten raven or other wildlife or plant populations (See 50 CFR 13.21(b)(4)).

This EA evaluates the Service's decisions to issue migratory bird permits for lethal removal of ravens in Nevada when applications meet the issuance criteria for permits under MBTA and applicable regulations. The Service is evaluating the effects to the raven population of increasing the total cumulative number of ravens that could be lethally removed based on available population estimates and trends as well as impact assessments. Migratory bird permits are issued by the Regional Bird Permit Offices. Permits in Nevada would be issued by the Service's Pacific Southwest Region Permit Office in Sacramento, California.

## 3. Background

### 3.1. Raven Life History and Trends

For life history and status of ravens in Nevada, including population trends, refer to Section 3.5.4.1 (p. 270) in USDA 2020.

Since 1966, there has been approximately a three-fold increase in the number of ravens nationally and a five-fold increase in the number of ravens in Nevada (Sauer et. al 2022). The population of ravens in Nevada used in USDA 2020 Appendix D modeling is 190,000 individuals (Partners in Flight 2013). However, it is evident that populations have continued to increase since the modeling was completed. The population of ravens in the United States is currently estimated at 2.5 million individuals, with 370,000 estimated in NV alone (Partners in Flight 2019). We were not able to re-evaluate the population modeling to reflect this increase in raven populations prior to drafting this EA, however the values we use are consistent with those analyzed in USDA 2020.

### 3.2. Raven Threats to Resources

For a description of raven threats to resources, refer to USDA 2020:

- Section 1.11.5 for natural resources, including Greater Sage-grouse (1.11.5.8, p. 116) and other wildlife species (1.11.5.9, p. 121);

Ravens have been described as one of the most significant limiting factors to the recovery of sensitive species in Nevada. Ravens depredate sage-grouse nests and chicks, and indirectly affect sage-grouse through habitat alteration. Anthropogenic development has supported a further increase in ravens and has made previously suitable habitat inadequate for sage-grouse. Recent evidence suggests that areas with raven densities greater than 0.4 km<sup>2</sup> have lower than average sage-grouse nest survival (Coates et al 2020). Similarly, the threshold for population stability for the federally endangered Desert Tortoise is 0.89 ravens km<sup>2</sup> (Holcomb et al 2021). Other sensitive wildlife species are likely impacted in a similar fashion.

- Section 1.11.2 for livestock;

Ravens have been noted as a significant threat to livestock, especially lambs. From FY12-FY16, ravens accounted for over \$100,000 in value of livestock injured or depredated, only behind mountain lions and coyote. Non-lethal methods have been used to minimize general predation risk, but strategies used to reduce canid predation often make livestock more vulnerable to corvid predation.

- Section 1.11.3 for agricultural resource and property other than livestock;

Ravens can cause substantial damage to agriculture, both directly and indirectly. They can disturb field crops, as well as fruit and seed crops, but also the buildings and

infrastructure necessary for agricultural development via nesting. Damage to power lines and equipment can result in outages and fires which can pose risks both locally and regionally. Ravens have also altered landfills by spreading garbage and through accumulation of fecal matter, risking human health and safety.

- Section 1.11.4 for public safety and health.

The increase in anthropogenic development has supported the growth of raven populations and has, thus, increased potential for human-avian conflicts. Risk of transmissible disease has become more prevalent as well. Furthermore, elevated raven populations can pose a greater safety threat through the heightened potential for collisions at airports and airfields.

#### Raven Removal Methods

Ravens in Nevada are predominantly taken using the avicide DRC-1339 (3-chloro-p-toluidine hydrochloride; EPA Special Local Need No. NV-150001). Other methods that may be authorized include, but are not limited to, firearms, hand capture, and nest/egg removal. In accordance with the Service's Standard Conditions for depredation permits, a permittee must have attempted to use non-lethal methods prior to applying for a permit. Some examples of non-lethal methods used for ravens are installation of physical barriers, elimination of attractants, minimization of perch availability, raptor abatement, and hazing techniques such as pyrotechnics, alarms and lasers. Permittees are required to continue to utilize non-lethal methods in conjunction with authorized lethal take.

DRC-1339 is currently registered in Nevada for use by WS-Nevada and the Nevada Department of Agriculture-Wildlife Services for addressing raven damage (EPA Special Local Need No. NV-150001). To use this method, hard-boiled chicken eggs are injected with DRC-1339 and placed strategically throughout a project area. The treated eggs are eaten by ravens, which leads to renal failure and death in 24 to 72 hours (Coates et al. 2007). DRC-1339 application methods are described in detail in USDA 2020, beginning on page 377.

Risks of DRC-1339 to non-target species are evaluated in several places in USDA 2020 (e.g., p.276, p. 347, p. 379, p.423). WS-Nevada concluded the following:

DRC-1339 poses little risk of secondary poisoning to nontarget animals, including avian scavengers. DRC-1339 poses no risk to aquatic nontarget wildlife. Nontarget birds and mammals that are sensitive to DRC-1339 may be at risk to DRC-1339, but this risk can be reduced through label language designed to reduce exposure. Risks to pollinators and terrestrial plants is negligible based on the use pattern of DRC-1339 and available limited effects data. The... application rates that are mostly on private lands, results in negligible risk for the public. Dietary risk from DRC-1339 exposure to the public is low since the avicide has no registered food uses and does not pose a threat to drinking water. The risk to... applicators is also low because they receive training in the product's use, are certified

by the State to use restricted use pesticides, and follow label instructions, including the use of appropriate PPE [personal protective equipment]. The release of DRC-1339 into the environment is expected to have no or negligible cumulative impacts to nontarget species, the public, and the environment.

The humaneness of DRC-1339 is addressed in detail in USDA 2020, section 3.9.5.2.3 (page 378). Observational reports of birds treated with DRC-1339 document that convulsions, spasms or distress calls have not been observed in birds receiving a lethal dose, rather the birds die a seemingly quiet death. Birds that get a lethal dose may show no outward clinical signs for many hours and go about normal activities. About four hours before death, the birds cease to eat or drink and become listless and inactive, and possibly comatose; they perch with their feathers puffed up and appear to doze.

## **4. Alternatives**

### **4.1. Alternative 1: Reduced Take Alternative (Preferred Alternative):**

We expect that requests for lethal raven take will continue to increase and will exceed the amount requested and permitted in the recent past. It was previously indicated to the Service in USDA 2020 that in order to provide protection to sensitive species adequate to meet species goals, they could, combined, request lethal take for up to 10,000 ravens per year. Allowing for an additional 1,000 ravens per year to protect other resources (e.g., human health and safety, agriculture, and livestock), under this alternative we would authorize the lethal removal of up to 11,000 ravens per year.

### **4.2. Alternative 2: Issue Permits for up to the Potential Lethal Take Maximum**

The Service and WS-Nevada modelled the maximum potential lethal take that could be authorized for the Nevada raven population that would result in a stable population below the maximum carrying capacity (USDA 2020 Appendix D). Using a model based on a 2013 estimate of raven populations, we estimated that we could authorize lethal take for up to 19,042 total ravens per year without causing a decline in the total Nevada population. This alternative would allow for lethal take of up to 19,042 ravens across the state of Nevada.

### **4.3. Maintain Permit at the Current Permitted Amount (No Action)**

The Service currently authorizes the lethal take of approximately 5,000 ravens per year. This alternative would authorize the same number under a renewed permit, without an increase in take allowances despite the expected increase in take requests.

## **5. Environmental Effects**

### **5.1. Population Analysis**

As a cooperating agency, the Service provided WS-Nevada a population model using the potential take limit method to assess the potential effects of removing ravens across Nevada (USDA 2020 Appendix D). The model uses the Potential Take Limit (PTL) method developed by USFWS – Division of Migratory Birds. The PTL method uses demographic estimates to produce the maximize potential fecundity estimate to develop a model to estimate different take levels that match management goals. We used the Partners in Flight (2013) estimate of raven abundance by state for this analysis. We were interested in modeling effects of take on the number of ravens in Nevada, which was estimated at 190,000. The results estimate that up to 19,042 ravens can be removed annually in Nevada while still maintaining a stable population as required by the permit issuance. The Nevada raven population estimate was updated to 370,000 in 2019, with a 95% confidence interval from 220,000 to 590,000 (Partners in Flight 2019). We continued to use the 2013 population estimate and modeling to maintain consistency with USDA 2020 and acknowledge that the model has a more conservative outcome than what we would expect if we were able to model the PTL using 2019 data.

The raven population in Nevada is not isolated and is part of a larger meta-population of ravens in the western United States. The Service authorizes take of ravens annually throughout the west. USDA 2020 analyzed the proposed take of 10,000 ravens annually in Nevada and also its effect on the population when added to the maximum raven take authorized in the previous 12 years across seven states wholly within the Pacific Flyway, excluding Alaska; these are the states of Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington (Section 3.5.4.3.3, page 276).

### **5.2. Alternative 1: Reduced Take Alternative**

#### **5.2.1. Effect on Raven Populations**

If the Service chooses this alternative, new permit applications and amended existing permits could be approved for authorized take of ravens, conditional on completeness, necessary qualifications, and rationale. Total authorized take would be possible up to 11,000 ravens as described above.

##### ***5.2.1.1. Adult Take***

We used a prescribed take level (PTL) model (Runge et al. 2009) to determine the effect of the proposed action on raven populations at the BCR scale. It combined the Great Basin (BCR 9) and Sonoran and Mojave Desert (BCR 33) because together they encompass the entirety of Nevada. This PTL model is used to predict the response of a population with a given population growth rate to different management objectives and can be used to prescribe take levels to achieve those objectives. In accordance with the MBTA and our

issuance of permits, the management objective in this case would be no net loss to raven populations. The model is simple in that it assumes immigration and emigration does not influence the population being modeled. Due to the fact that we are analyzing population level effects on a large geographic scale, this “closed population” assumption is realistic.

The results of this model indicate that the population growth rate for ravens was approximately 0.230 for the 50th percentile. The Bayesian state-space model, which accounts for variances of process and observation error, results in a similar rate of 0.234. Therefore, ravens may sustain an annual take of approximately 12.5% of the populations and remain stable at about one-half of the carrying capacity. Using a population size of approximately 190,000 ravens in Nevada, the 50th percentile PTL is 19,042 individuals. The 95% confidence interval ranges from 3,212 individuals to 46,305 individuals. Based on these results, we can conclude that 19,042 ravens could be removed annually from the state of Nevada and the population would not decline.

Accounting for population growth since the model was developed (Partners in Flight 2019), removing 11,000 ravens equates to a take rate of approximately 2.99%. While that amount of take would be expected to reduce the rate of population growth, it would not reverse population growth or even cause it to remain stable.

The reduced take alternative was developed based on what was thought to be achievable in recent years. The proposed amount of take in this alternative represents a level that is expected to help manage raven impacts on sensitive species, but may not be sufficient to provide desired levels of species protection.

#### **5.2.1.2. *Egg Take***

Aside from the use of DRC-1339, it is possible that raven take could result from egg take via egg oiling and nest removal. Determining the number of eggs equivalent to one adult raven is important in maintaining authorized take levels. In order to do so, the Migratory Bird Permit Program developed a conversion rate of eggs to fledged ravens. To calculate fledging success, hatching success rate was multiplied by percentage of nestlings fledged for a 56% success rate (Knittle 1992, Smith and Murphy 1973a, Stiehl 1985). Therefore, approximately two raven eggs are equivalent to one fledged raven. This conversion should be used when considering overall raven take.

#### **5.2.2. Effects on other species**

The majority of raven take is related to the protection of Greater Sage-Grouse, according to WS-Nevada. Schroeder and Baydack (2001) suggested that as the habitat for this species become more fragmented, it becomes more important to consider pest management strategies to increase recruitment. Ravens have been documented as the most common predator of Greater Sage-Grouse nests, and their removal at local levels has shown to increase Greater Sage-Grouse recruitment and nest success (Coates et al. 2008, Lockyer et al. 2013, Peebles et al. 2017). An



increase in permitted raven take may increase Greater Sage-Grouse numbers in Nevada, particularly in areas where they may be already affected by human presence.

### **5.2.3. Effects on Non-Target Migratory Birds**

#### **5.2.3.1. *Black-billed Magpie***

Like ravens, magpies are omnivorous, opportunistic, and their diet includes eggs (Hall 1994). As such, and because it is a corvid (see Section 3.4.1), magpies might be exposed to DRC-1339-laced eggs. Precautions will be taken to expressly limit their exposure (see USDA 2020 Section 3.4.3), but some individual birds might be incidentally killed.

The estimated population of Black-billed Magpie in Nevada is 210,000 individuals (Partners in Flight 2019). Their population trends are relatively inconsistent and do not demonstrate a strong increase or decrease (Sauer et. al. 2022). There is no indication of a distinct increase or decrease in population size through the past 40 years.

With the abundance and somewhat stable trends at larger scales described above, any incidental take of magpies is not expected to be measurable at the fine, county, and BCR scales. Therefore, the incidental take of magpies associated with the proposed alternative is not significant.

#### **5.2.3.2. *American Crow***

Crows are a highly intelligent and omnivorous corvid that also eat eggs (Johnson 1994). As with magpies, crows might be exposed to DRC-1339-laced eggs during the course of this action. The same exposure precautions will be taken as for magpie (see USDA 2020 Section 3.4.3), but some individual birds might be incidentally killed.

Crows are ubiquitous in the U.S. with an estimated population of 28 million individuals. In the state of Nevada, there are an estimated 72,000 individuals (Partners in Flight 2019). Populations trends, however, are showing a mixture of non-significant and significant declines in Nevada and generally across the Western U.S. BBS routes. The negative trend is steeper over the most recent two decades of analysis than the 50-year trend (Sauer et. al. 2022). Any incidental take of American Crows that might occur because of this experiment is expected to be undetectable at the population level at the fine, county, and BCR scales. Therefore, the incidental take of American Crows associated with the proposed alternative is not significant.

#### **5.2.3.3. *Other Corvids***

Most members of the Family Corvidae (or 'corvids', including ravens, crows, jays, nutcrackers) prey on eggs of other birds (Jones and Hungerford 1972, Sieving and Willson 1999, Trost 1999, Verbeek and Caffrey 2002, Coates et al. 2008, Howe and Coates 2014) although the extent to which they may eat larger eggs such as the poultry eggs (used to deliver DRC-1339) varies by species. They also tend to be more sensitive to DRC-1339 than other species of birds (see Section 3.4.1.). Corvids which co-occur with sage-grouse habitat

include raven, American Crow (*Corvus brachyrhynchos*), and Black-billed Magpie (*Pica hudsonia*). Pinyon Jays (*Gymnorhinus cyanocephalus*) and Woodhouse's Scrub-Jays (*Aphelocoma woodhouseii*) live in pinyon and juniper woodlands and will likely not be exposed to these baits.

#### **5.2.4. Effects to Raptors and Other Scavengers**

DRC-1339 is considered to be highly selective because (1) the delivery method can be targeted to avian species that consume eggs (e.g., corvids) and (2) the lethal dose (LD<sub>50</sub>) for corvids is ≤10 times that of most raptors and mammals. It is highly unlikely that use of DRC-1339 would result in death of raptors and scavengers of dead ravens because of the product's relatively low toxicity to species that might scavenge on birds killed by DRC-1339, and because of the tendency for DRC-1339 to be rapidly and almost completely metabolized in the target birds (Cunningham et al. 1979). Because death occurs in the target species upon excretion of harmless DRC-1339 metabolites, only minimal residual amounts of unmetabolized DRC-1339 typically remain in the target's carcass, and the residual is typically below toxic levels to avian and mammalian scavengers (DeCino et al. 1966, Cunningham et al. 1979, Schafer 1984, Eisemann et al. 2003). Laboratory research and field trials have shown that lethal secondary exposure of non-target species through consumption of raven carcasses is highly unlikely (DeCino et al. 1966, Besser et al. 1967, Ford 1967, Royall et al. 1967, Cunningham et al. 1979).

It is unlikely that the ground squirrels that consume egg baits are affected by DRC-1339 as the LD<sub>50</sub> for similar sized small mammals is very high (Ford 1967, Sterner et al. 1992). In fact, the amount needed to kill a fasted female albino rat is 1170 mg/kg; using this as a proxy, an average-sized ground squirrel (0.33 kg) would need to consume 386 mg of DRC-1339, the equivalent of nearly 200 eggs (each baited egg contains approximately 2 g of chemical; Coates et al. 2007).

No additional indirect or cumulative effects are anticipated for non-target species. No significant effects are anticipated.

#### **5.2.5. Endangered Species Act Listed Species**

There are currently 40 species listed under the Endangered Species Act (ESA) in Nevada, as well as designated critical habitat. Given the selective nature of DRC-1339, none of the listed species are expected to be affected by its use. NDOW and WS-Nevada have coordinated with the Service on formal and informal Section 7 consultations whenever threatened or endangered species are present in their targeted areas. WS-Nevada is required to stay in continued compliance with the ESA and to use the proper precautions to avoid any impacts to listed species.

#### **5.2.6. Other Effects**

The proposed reduced take action (preferred alternative) will not have a significant effect on individuals who wish to experience ravens in the natural environment because its limited geographic and temporal scope, combined with the rebounding and increasing trend of raven

populations ensure that raven populations ultimately will be maintained. The proposed action aims to temporarily reduce the distribution and density of, but not eliminate, ravens in areas of risk to protected species and human-avian conflict and thus ravens will continue to be available in those and other areas of the natural environment across the landscape for birdwatchers and others seeking to enjoy them.

The Potential Lethal Take Maximum was formulated to support a stable raven population below their carrying capacity in the state of Nevada. The aim of the Service's Migratory Bird Permit program is not to manage species populations. Rather, it is to support healthy population numbers, minimize human-avian conflict, and assist in the protection of high-risk species. By reducing raven populations to values deemed to benefit sage-grouse in peer-reviewed literature and by implementing the most humane methods for taking ravens, we believe that the reduced take action (preferred alternative) will not significantly affect individuals who seek to experience ravens in the natural environment.

### **5.3. Alternative 2: Authorize up to the Potential Lethal Take Maximum**

#### **5.3.1. Effects on Raven Populations**

If the Service chooses this alternative, new permit applications and amended existing permits, conditional on completeness and necessity, could be approved for authorized take of ravens. Total authorized take would be possible up to the potential lethal take maximum.

##### ***5.3.1.1. Adult Take***

The Service estimates that there could be authorized take of up to 19,042 ravens in Nevada without causing a decline in the overall population. This value is known as the Potential Lethal Take Maximum.

Using the same model and estimation process as above, we evaluated the impact of increased take on raven populations. At the BCR scale, removing the Potential Lethal Take Maximum of 19,042 ravens equates to a take rate of approximately 5.14%, and thus would have a significant effect on population growth (Partners in Flight 2019). The Service considers a flyway- or BCR-scale for most migratory bird species; the analysis at the BCR scale is appropriate for ravens because they are highly mobile and the local population is not considered unique. The current population estimate of ravens at a given time in Nevada, based on estimates from BCR 9 and 33, is 370,000 individuals (Partners in Flight 2019).

The effect of this alternative on the raven population would be more significant than the other options. Since it would take considerable effort to remove more than 19,000 ravens per year, it is uncertain that the actual number of ravens taken would be close to the potential lethal take maximum. However, under this alternative it would be both an option and legal to do so. Therefore, we must analyze the impacts of this alternative as such.

#### ***5.3.1.2. Egg Take***

The majority of raven take across all alternatives will be conducted by using DRC-1339 on adults, and egg oiling is expected to be minimal. We do not expect that the number of eggs oiled will be significantly different between the alternatives.

#### **5.3.2. Effects on Sensitive Species**

The majority of lethal raven take is expected to be for the purpose of minimizing Greater Sage-Grouse predation, based on previously reported need (USDA 2020). Pursuing the maximum amount of take would presumably increase the benefit for this sensitive species in particular, especially in low quality habitat (Schroeder and Baydack 2001). However, since take has not been authorized to this level in Nevada before, the exact extent of benefits is not clear.

#### **5.3.3. Effects on Non-Target Species**

Under this alternative, egg baiting would potentially be more widespread since the authorized take limit is the greatest. Therefore, the chances for nontarget species to be exposed to the avicide DRC-1339 would be higher as the authorized take would increase. The effects to populations of Black-billed Magpie and American Crow, as well as other corvids, raptors and scavengers, would likely increase as a result. However, as discussed in section 5.3, the impacts to these species is expected to be minimal.

### **5.4. Alternative 3: Continue issuing permits up to presently authorized take limits (No Action)**

#### **5.4.1. Effects on Ravens**

If the Service chooses this alternative, any new permit applications or amendments to existing permits requesting additional take would not be approved. The Service's decision would result in no effect on current raven population trends or sizes. It is likely that the raven population would grow at all geographic scales to some unknown upper limit in response to human population growth and accompanying infrastructure.

##### ***5.4.1.1. Adult Take***

The average amount of actual take of ravens by WS-Nevada between 2012 and 2016 is 3,826 per year. This can be broken down into 25% for the protection of livestock, 64% for the protection of greater sage-grouse, and 10% for the purpose of human safety in the form of utilities, landfills and property. Recently additional effort has been applied to species protection and the total take is up to the permitted amount. If alternative 3 was chosen, we could expect the numbers of ravens taken to remain at the total permitted number. The raven population within Nevada is not expected to be impacted to an extent greater than at the current level of take.

##### ***5.4.1.2. Egg Take***

Egg take should be considered in the same manner as Alternative 1.

#### **5.4.2. Effects on Sensitive Species**

Under this alternative, there would be no additional risk of non-target effects from the application of DRC-1339 compared to current conditions. However, it is possible that increasing raven populations also have a negative population effect on non-target species. Populations of sensitive species which are affected by ravens would be expected to experience increased effects (e.g., livestock and Greater Sage-Grouse) or competitive interactions for food or nest sites (for example Black-billed Magpies and American Crows; Wilmers et al. 2003, McKinstry and Knight 1993). Thus, populations of other species under this option could decrease at a faster rate within treatment areas than they might if the Service chooses either Alternative 1 or 2.

### **5.5. Cumulative Effects**

The cumulative effect of raven take in NV on the Pacific Flyway raven population was evaluated in USDA 2020 in section 3.5.4.3.3 starting on page 276; that evaluation is adapted in the following paragraphs. USDA 2020 evaluated an increase of raven take in NV to 10,000 but included a contingency of 4,000 for increased take beyond that level; our preferred alternative would authorize an increase to 11,000, which is well within the contingency considered in USDA 2020.

The common raven population in Nevada is not isolated and is part of a larger meta-population of common ravens in the western United States. The USFWS authorizes take of common ravens annually throughout the west. The analysis considered the effect of the proposed take level in Nevada on the population when added to the maximum common raven take authorized in the previous 12 years (spanning 2006-2017) across the 7 states wholly within the Pacific Flyway, excluding Alaska; these are the states of Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington. Using the maximum take authorized for each state during that period, and summing those values for each state, yields a hypothetical upper estimate of the maximum take of 19,361 common ravens that might be authorized during any single year of the proposed efforts. This is a hypothetical maximum for authorized annual common raven take. Given the permit history within these states from 2006 through 2017, the real maximum take authorized in any given year across that geography occurred in 2014, and was 15,387 common ravens. The estimate of the number of common ravens that were actually taken is substantially lower than authorized take each year. The maximum number that was reported taken in any year was 8,007, in 2013.

The cumulative effects analysis assumed a hypothetical maximum take scenario in which 23,361 common ravens are killed per year across these 7 western states (19,361 plus a contingency of an additional 4,000 to account for potential increases associated with continued growth of the common raven population over time). The estimated size of the common raven population in these states was 1,002,000 (Partner in Flight Science Committee 2013). Thus, the potential annual take of common ravens under this scenario would amount to about 2.33% of the total raven population in these western states. This percentage is well below the maximum sustainable yield, which is estimated to be 10% for the State of Nevada. Further, the populations of common ravens in each of these states has continued to increase significantly despite the take authorized by the USFWS.

The sum of the authorization considered in the preferred alternative with other similar actions across 7 western states suggests that, cumulatively, these authorized common raven mortalities will not affect the long-term viability of common ravens. In contrast, USFWS expects common raven populations to continue to grow coincident with the expanding human population in the west, as it has over the last 50 years.

## **6. Persons Consulted, Collaborators, and Stakeholders**

When WS-Nevada began the process for USDA 2020 in 2016, an invitation to participate in the development of the EA and the offer of consultation were sent to all federally recognized Tribes in Nevada. In response, WS-Nevada received two phone calls from Tribes, one clarifying the intent of the EA and the other expressing support for the process. In the spring of 2019, WS-Nevada sent all federally recognized Tribes in Nevada a copy of the USDA 2020 draft for their review along with another invitation to engage in consultation. The Summit Lake Paiute Tribe responded with a letter and in October 2019, WS-Nevada and the Summit Lake Paiute Tribe met to discuss USDA 2020 and how the PDM activities may affect the Tribe and their cultural values (USDA 2020 Section 3.12.2, page 453).

During preparation of USDA 2020, WS-Nevada received three comments related to the proposed raven management activities. Two of the comments supported the proposed action, and one opposed the action claiming there is no science supporting raven management for protection of sage-grouse. Responses to comments are in USDA 2020 Section 5.25, page 556.

The Service reached out to all federally recognized Tribes in Nevada as well as state agencies and other stakeholders for comments on the draft of this EA. The EA was posted on January 24<sup>th</sup> 2024, and the commenting period was open for 30 days. We received 11 responses from a variety of state and county organizations (Appendix B). The most common comments were that none of our alternatives allowed for enough permitted take of ravens in Nevada, that we should be taking a population-based approach to determine the amount of raven take is necessary to benefit sage-grouse and other sensitive species, and that we should update our analysis to incorporate newer data. Table 1 shows the comments we received and our responses to them.

Table 1: Comments received on the draft EA and the Service's responses.

RESPONSE LETTER AND COMMENT NUMBER	COMMENT	SERVICE'S REPOSE
Nevada Department of Wildlife (NDOW.1)	(Page 1, Section 1, Paragraph 1) The purpose of the EA should be clearly stated. The purpose should be to bring common raven population numbers in Nevada to a level that is more in line with natural ecosystems and carrying capacities rather than those artificially elevated by anthropogenic subsidies. It should be made clear that this goal, or objective, is not in conflict with the Migratory Bird Treaty Act in that, even with fairly significant reductions in the common raven population in the Great Basin, that would not "threaten" raven populations at regional or range-wide scales.	The purpose of this EA is clarified: "This EA evaluates the Service's decisions to issue migratory bird permits for lethal removal of ravens in Nevada when applications meet the issuance criteria for permits under MBTA and applicable regulations. The Service is evaluating the effects to the raven population of increasing the total cumulative number of ravens that could be lethally removed based on available population estimates and trends as well as impact assessments."
Nevada Department of Wildlife (NDOW.2)	(Page 1, Section 2, Paragraph 1, Sentence 1) While this statement may be true in some respects, it does not adequately portray the current situation as the common raven population has expanded in both distribution and numbers to the point that more natural predator - prey relationships are no longer in balance. Furthermore, this predator - prey imbalance could be allowing common ravens to have a more significant "top down" effect on sensitive prey species (e.g., Greater sage-grouse and desert tortoise) than if in natural ecological balance.	The remainder of the paragraph makes the same point as the comment.
Nevada Department of Wildlife (NDOW.3)	(Page 2, Section 2, Paragraph 3, Sentence 1-2) Much of this paragraph seems to be mostly repetitive information and therefore may not be necessary.	Edited for clarity
Nevada Department of Wildlife (NDOW.4)	(Page 3, Section 3, Paragraph 2, Sentence 2) The 2020 WS-EA reference is confusing. It is also not included in the bibliography.	Edited for clarity

Nevada Department of Wildlife (NDOW.5)	(Page 3, Section 3, Paragraph 2, Sentence 2) We could not find “Partners in Flight 2013” in the literature cited section.	Added to Lit Cited (Partners in Flight 2013. Population Estimates Database, version 2.2. Available at <a href="http://pif.birdconservancy.org/PopEstimates">http://pif.birdconservancy.org/PopEstimates</a> . Accessed on February 01, 2018.)
Nevada Department of Wildlife (NDOW.6)	(Page 3, Section 3, Paragraph 2, Sentence 2-3) These values indicate a 94% increase in the population of common raven over the last decade. During that same approximate time frame, sage-grouse populations have declined at a rate 5.1% per year (Coates et al. 2021) and important vital rates (e.g., nest success) have been proven to be negatively affected once common raven densities reach certain thresholds (0.4 raven/square kilometer).	Comment is a statement; no response needed
Nevada Department of Wildlife (NDOW.7)	(Page 3, Section 3, Paragraph 2, Sentence 4) Rapidly growing common raven populations is a known issue; the USFWS gives no rationale why they agree that Nevada’s population is 370,000 individuals, yet an older estimate is used to estimate maximum take.	We used the best available data at the time to run the PTL analysis, and also are being consistent with numbers in USDA 2020.
Nevada Department of Wildlife (NDOW.8)	(Page 4, Section 3, Paragraph 3, Sentence 3) In this paragraph, some mention should be made with respect to how difficult some of these methods may be to employ across large landscapes, whether they be the sagebrush ecosystem for Greater sage-grouse or the Mojave desert for desert tortoise.	Comment is a statement; no response needed
Nevada Department of Wildlife (NDOW.9)	(Page 4, Section 3, Paragraph 4, Sentence 3) This sentence is misleading. Consider “The treated eggs are eaten by ravens, which leads to renal failure and death in 24-72 hours (Cunningham et al. 1979, Coates et al. 2007)	Updated in EA



Nevada Department of Wildlife (NDOW.10)	(Page 5, Section 4, Paragraph 1, Sentence 2) NDOW does not agree that a lethal take of 10,000 ravens per year will be adequate to provide protection to sensitive species. Especially given the current status of raven populations. However, NDOW does feel that the lethal take of up to 10,000 ravens would allow increased protection over the current 2,500 lethal take, both temporally and spatially, for sensitive prey species, while possibly dampening the intrinsic growth rate (r) of ravens at local or site scales. On November 20, 2023, NDOW emailed a copy of a renewal request for permit #mb37116a-0; this request was for 10,000 ravens for 2024. This did not include a take request from USDA WS or other permittees.	We recognize NDOW's comment and will consider adopting the maximum take alternative. The 10,000 lethal take amount was based on previous cumulative requests for raven take and the number used in USDA 2020's analysis. We acknowledge that the need and requests for take has increased over the last few seasons, and continue to work with WS-Nevada to address these changes.
Nevada Department of Wildlife (NDOW.11)	(Page 6, Section 5, Paragraph 1, Sentence 3) We question why the Service would use the 2013 estimate of raven abundance from Partners in Flight (also not in the literature cited section) instead of the more recent data from Partners in Flight from 2023 where the raven population estimate was updated to 370,000 individuals in Nevada. The PIF 2023 reference is also not in the literature cited section.	The model was run with the best data available at the time, and this model was used in USDA 2020. We acknowledge that the population of Ravens in Nevada has increased since it was run, and have edited the section for clarity. Citations have been updated.
Nevada Department of Wildlife (NDOW.12)	(Page 6, Section 5.2.1.1, Paragraph 1, Sentence 4) This sentence states that "In accordance with the MBTA, the objective in this case would be no net loss to raven populations." We could find no language within the MBTA where "no net loss" was a goal or an objective for managing predatory species such as common ravens.	Section was edited for clarity
Nevada Department of Wildlife (NDOW.13)	(Page 7, Section 5.2.1.1, Paragraph 2, Sentence 1) We would argue that the removal of 11,000 ravens (which equates to a take rate of 2.99%) would have a "significant effect" on common raven population growth. Also, we could not find a reference in the literature cited section for "Partners in Flight 2020". In fact, this statement seems contradictory to the statement in the paragraph above that indicates that ravens may sustain an annual take of approximately 12.5% of the population and will continue to remain stable (i.e., allowing 2.99% lethal take to be completely compensatory morality).	Citations have been updated.

Nevada Department of Wildlife (NDOW.14)	(Page 7, Section 5.2.1.1, Paragraph 3, Sentence 1-2) Again, NDOW does not feel that the take of 11,000 ravens per year will ensure adequate protection for sensitive species given that raven population have increased by 94% in the last decade to an estimated 370,000 individuals. Conversely, NDOW feels that with the continual expansion and infill of raven populations and exponential growth in the Great Basin, mortality to sensitive prey species (e.g., Greater sage-grouse and desert tortoise) could become totally additive across all resource scales (first, second, third and fourth orders).	We recognize NDOW's comment and will consider adopting the maximum take alternative. The 10,000 lethal take amount was based on previous cumulative requests for raven take and the number used in USDA 2020's analysis. We acknowledge that the need and requests for take has increased over the last few seasons, and continue to work with WS-Nevada to address these changes.
Nevada Department of Wildlife (NDOW.15)	(Page 7, Section 5.2.1.1, Paragraph 3, Sentence 3)The sentence states that the “Increasing raven populations, along with an increased presence of human activity, can be expected to lead to a greater need for resource protection”. That time is now. Currently, there is a greater need for resource protection due to increased raven populations.	We recognize NDOW's comment and will consider adopting the maximum take alternative. The 10,000 lethal take amount was based on previous cumulative requests for raven take and the number used in USDA 2020’s analysis. We acknowledge that the need and requests for take has increased over the last few seasons, and continue to work with WS-Nevada to address these changes.
Nevada Department of Wildlife (NDOW.16)	(Page 7, Section 5.2.6, Paragraph 2, Sentence 1)Would this sentence be more appropriate in section 5.3 since it is supporting the Potential Lethal Take Maximum?	Section was edited for clarity
Nevada Department of Wildlife (NDOW.17)	(Page 10, Section 5.3.1.1, Paragraph 2, Sentence 2) The sentence states that a take rate of 5.18% (19,042) would have a significant effect on population growth. This is in contradiction with the statement on page 7, section 5.2.1.1 that states that ravens may sustain an annual take of approximately 12.5% and continue to remain stable. Therefore, we do not agree that a take of 5.18% would have a significant effect on the population growth rate of common ravens.	The section was edited for clarity.
Nevada Department of Wildlife (NDOW.18)	(Page 12, Section 5.5, Paragraph 3, Sentence 1) Common ravens in Nevada are part of a larger metapopulation (O’Neil et al. 2018)	The section was edited for clarity.

Nevada Department of Wildlife (NDOW.19)	(Page 13, Section 5.5) The Service arrives at the conclusion that the preferred alternative (reduced take) will not affect the long-term viability of common ravens and that, in contrast, the Service expects the population to grow given this alternative, which is not in alignment with conserving certain species of special concern and listed species.	We recognize NDOW's comment and will consider adopting the maximum take alternative.
Humbolt County (HC.1)	...the Board recommends that the FWS increase the "maximum take" of ravens to a level that would reduce raven overpopulation; the FWS should develop an Environmental Impact Statement (EIS) for that purpose as a replacement for, or subsequent to, this EA.	See response to NDOW.10
Humbolt County (HC.2)	In Section 2 "Need for Action" the FWS fails to identify a problem with sufficient clarity to inform an analysis of the alternatives. A reader must connect-the-dots and decode oblique language to figure out what the problem is and why the action is being proposed. This is a failure of NEPA adequacy.	Edited for clarity
Humbolt County (HC.3)	As a matter of NEPA disclosure, the FWS must (but fails to) provide an explanation why it is limiting lethal take across all alternatives to a level that would not affect raven overpopulation.	See response to NDOW.1
Humbolt County (HC.4)	We further note that the FWS does have the authority to reduce the overpopulation of ravens, if it wishes to: "The MBTA gives the Service broad authority to protect birds, but also to regulate their taking as long as their conservation is assured; the issuance of these permits must ensure that authorized take will not potentially threaten raven or other wildlife or plant populations (See 50 CFR 13.21(b)(4))." Clearly, reducing raven overpopulation to normal levels does not threaten the raven population or the species' conservation.	See response to NDOW.1
Humbolt County (HC.5)	We further suggest that reducing raven overpopulation is also the responsibility and duty of the FWS as administrator of both the MBTA and the ESA-the MBTA was never intended to result in extreme predator overpopulations that contribute to the listing of a prey species (like the GRSG) under the ESA.	See response to NDOW.1
Humbolt County (HC.6)	FWS should coordinate with NDOW to develop at least one alternative with raven take limits that will effectively protect Nevada's GRSG populations. Adding one or more such alternative will likely require the preparation of a subsequent EIS.	See response to NDOW.14

Humbolt County (HC.7)	The EA cannot base a "maximum take" number on outdated data. At a minimum, the FWS should base its "maximum take" on current 2023 population estimates. In addition, and as mentioned in Comment 3 (above), we also find that a "maximum" take for raven permits should reflect the maximum take for sustainably reducing raven overpopulation, not maintaining raven overpopulation.	See response to NDOW.14
Humbolt County (HC.8)	The FWS should immediately coordinate with NDOW and WS-NV to ascertain their views on raven population control and sensitive species protection requirements. If the FWS has misrepresented their views in the EA, it should immediately issue a public correction, and extend the comment period to ensure the public has a chance to review accurate information.	The Service is in communication with NDOW and WS-NV and has edited the referenced section.
Humbolt County (HC.9)	FWS clearly should have included NDOW as a cooperating agency on this EA to assist in determining raven take limits that would protect GRSG and Desert Tortoise. (WS-NV should also have had cooperating agency status.) The FWS apparently undertook to write this EA on its own, and managed to misrepresent the views of the agencies it should have included in the process.	The Service is in communication with NDOW and WS-NV and has edited the referenced section.
Humbolt County (HC.10)	The FWS should seek consistency with the Nevada Legislature's resolution by issuing raven take permits sufficient to protect the GRSG and the Desert Tortoise from undue depredation.	See response to NDOW.1
Elko County (ELKO.1)	The Draft EA states that "[u]sing a conservative model based on a 2013 estimate of raven populations, we estimated that we could authorize lethal take for up to 19,042 total ravens per year without causing a decline in the NV population." This implies that either of the other options would result in an increase in the raven population	See response to NDOW.1

Elko County (ELKO.2)	Many human activities subsidize raven population growth.1 Section 6.4.1.1 of the Elko County Sage Grouse Management Plan calls for reducing man-made perches, installing anti-perch devices on power poles, and reducing other available subsidies to reduce the raven population by providing less suitable habitat. However, this does not address the ravens that are currently on the range, or remove ravens from lekking areas. That is why Elko County also urges managing agencies to use lethal predator control on un-endangered species like ravens.	See response to NDOW.14
Elko County (ELKO.3)	Lethal control has been shown to increase sage grouse nest success in Nevada. By increasing the number of take permits available, the USFWS will be giving managing agencies tools that have been shown to be effective in increasing sage grouse nest success.	See response to NDOW.14
Nevada Association of Counties (NACO.1)	While FWS acknowledges the “significantly increasing trend” in raven populations over recent decades and the exceptionally high, “five-fold increase in the number of ravens in Nevada”, between 1966 and 2013 as well as ravens’ role as the “most significant limiting factor to the recovery of sensitive species in Nevada” in the Draft EA, it does not then prescribe the appropriate level of take permits to meaningfully combat this population increase and the threats it poses. We are puzzled by USFWS reluctance to authorize the appropriate level of take to offset the exponential growth in raven populations in Nevada – growth which has been subsidized by human development and will be further subsidized given the current development and industrialization trends in the state.	See response to NDOW.14
Nevada Association of Counties (NACO.2)	We are also concerned with the use of 2013 population data as a baseline for take permit decision making when, as FWS acknowledges, more recent data is available and reflects the continuing growth trend. ...The Draft EA should not base a maximum take level on the outdated 2013 data. The FWS should base its maximum take on current 2023 population estimates and the maximum take for raven permits should reflect what is needed for reducing raven population to sustainable levels, instead of maintaining the current situation of overpopulation and exponential growth.	See response to NDOW.7

Nevada Association of Counties (NACO.3)	We request that FWS add an alternative to this environmental assessment that is based on the threshold to minimize raven's impact to sensitive and threatened species – a Sage Grouse Benefit Alternative. This is the only means of fulfilling the purpose and need for this NEPA effort and of FWS meeting its wildlife management obligations. Continuing to allow raven overpopulation to depredate sensitive and threatened species, not to mention the State's declining agricultural production, is unacceptable.	We are aware of the larger concerns for species protection in NV, however this EA was more narrowly written to examine the impacts of increasing the total amount of raven take, especially via depredation permits, in the state of Nevada. We will continue to work with our partners to understand their needs for protection of species and other resources in NV.
Nevada Association of Counties (NACO.4)	We strongly encourage an EIS of a raven take and depredation scenario that meets species conservation needs and intervenes in the anthropogenic disturbance → raven overpopulation → sage grouse depredation chain of events. The USGS research and mapping tools establish a means by which the Nevada Department of Wildlife (NDOW) and Nevada Wildlife Services (WS-NV) could effectively apply avicides and direct other lethal take measures to reduce impacts to sensitive species in a targeted manner. This cannot be done, however, at the inadequate take levels considered in this EA.	See Response to NACO.3
Nevada Association of Counties (NACO.5)	The reality is that even at fulfillment of the Lethal Take Maximum (19,042 ravens eliminated from the Nevada range), raven populations will not stabilize at population densities that are sustainable for the sensitive and threatened species on which they frequently prey.	See Response to NACO.3
Nevada Association of Counties (NACO.6)	NACO also contests the assertion in the Draft EA that the Nevada Department of Wildlife (NDOW) or Nevada Wildlife Services (WS-NV) have only requested take up to 11,000 ravens per year. Both state wildlife management entities are very much aware of the exponential growth rate in raven populations across the Great Basin, and of the science indicating the ravens' resulting impacts to sage grouse nest survival rates.	The Service is in communication with NDOW and WS-NV. The upper limit of 10,000 ravens per year was based on dated information but is consistent with USDA 2020. Existing applications, received after October 2023, exceed 12,700 ravens per year and we expect that number to climb with additional resources to protect greater sage grouse, and the protection of additional sensitive species (e.g., desert tortoise) in the near the future.

Nevada Association of Counties (NACO.7)	The FWS should seek consistency with the Nevada Legislature's resolution by issuing raven take permits sufficient to protect sensitive species, livestock, agricultural resources, and property from undue raven depredation.	We recognize the Nevada Farm Bureau Federation's comment and will consider the maximum take alternative.
Nevada Farm Bureau Federation (NFB.1)	Frankly, we are uncertain why the "preferred Alternative" was selected to be the option that the U.S. Fish and Wildlife Service chose? We were of the belief that protection of Sage Grouse was a priority and by the Service's documentation in the Draft EA, the Potential Lethal Take Maximum (Nevada Farm Bureau's preference) would provide a greater degree of protection for Sage Grouse "without causing a decline in the Nevada population" of Ravens.	We recognize the Nevada Farm Bureau Federation's comment and will consider the maximum take alternative.
Lander County (LC.1)	The EA does not provide an alternative that focuses on the reduction of the Raven populations in Priority Habitat Areas for GRS. If the increase in Raven populations and decrease in GRS populations are intrinsically linked (which was not apparent in the Draft EA), the focus of Raven culling in Priority Habitat Areas would be a preferred alternative.	It is our understanding that the majority of the depredation for the purpose of protecting Sage Grouse is currently done in a targeted manner, concentrating in areas with high amounts of conflict. The permits with the highest amount of take, NDOW and Wildlife Services, do not specify where in the state take has to occur and can be done at their discretion.
Lander County (LC.2)	If Ravens are to be killed, one would think the goal would be to reduce their population in meaningful numbers to achieve a response to the degradation that Ravens are causing. If the population is affected at the permit level for damages, this EA is not needed, unless other data is provided to show the current number of Raven takes allowed does not meet the needs for damage depredation permits pursued.	See response to NACO.3

Lander County (LC.3)	Data should be provided for assessing public health concerns for ravens vs. seagulls and other corvids at landfills and other places of concern. ... If Ravens are posing larger risks at airports than other avian species, this anomaly should be presented for the public to comment on increased takes of this species of bird needing lethal means for conflict resolution.	We assume that this comment is regarding food subsidy provided by landfills, and how that subsidy supports ravens population growth that then contributes to problems with overabundant species. Conflict resolution should include subsidy management and other non-lethal measures, and not just lethal take. See Management of Conflicts Associated with Common Ravens in the United States, available at <a href="https://www.fws.gov/library/collections/raven-conflict-management">https://www.fws.gov/library/collections/raven-conflict-management</a> .
Lander County (LC.4)	If the case is made that eligible livestock owner depredation permit applications are denied because the limit on allowable Raven takes have been met then a NEED has been shown to increase the number of Raven depredation permits issued. If this scenario exists, it should be presented as a need for this EA.	The Service is aware that with the increase in raven populations there will be an increase in the need for depredation permits for the protection of livestock. If we adopt an alternative other than 4.3 we would be able to respond to requests for increased take for all authorized purposes, including livestock protection.
Lander County (LC.5)	Lander County must emphasize that FWS should concentrate on its role in evaluating new actions that affect GRSG habitat in a detrimental way. A positive example, would be promoting siting transmission lines and new disturbances outside of GRSG Priority Habitat Areas. FWS should take a stand on the plight of GRSG in a more meaningful way to recover this species.	The Service agrees with siting transmission lines and new disturbances outside of GRSG Priority Habitat Areas. We make this recommendation whenever possible when providing technical assistance to other agencies.
Nevada Department of Agriculture (NDA.1)	Background shows an estimated population of 370,000 ravens in Nevada. This is a significant increase over the 2013 estimate of 190,000 ravens. With trends in sensitive wildlife species populations moving downward and the increased requests for agriculture assistance, now is the time to address the raven overpopulation in Nevada.	See response to NDOW.7



Nevada Department of Agriculture (NDA.2)	The NDA takes exception to the statement that NDOW and WS-Nevada requested 10,000 ravens per year. Our close coordination with both agencies provides us with knowledge of permit requests totaling more than 10,000 ravens.	See response to NDOW.6
Nevada Department of Agriculture (NDA.3)	The modelled maximum potential lethal take is based on the 2013 population estimate. The NDA requests the modelling be done on the 2023 estimates, to reflect current conditions more accurately in Nevada.	See response to NACO.7
Nevada Department of Agriculture (NDA.4)	... the agency requests USFWS create an adaptive management alternative. This alternative would allow for real-time adjustments to be made based on populations and impacts, and not dependent on an often-delayed NEPA analysis.	See response to NACO.3
Nevada Department of Agriculture (NDA.5)	The NDA requests clarification on the maximum number of ravens able to be taken annually from Nevada, while allowing for stable populations.	See response to NDOW.11 and NDOW.12
Nevada Department of Agriculture (NDA.6)	The peer reviewed final document titled “The Use of DRC-1339 in Wildlife Damage Management” states in section 2.4.2 Mode of Action, “In sensitive birds, DRC-1339 causes irreversible kidney and heart damage resulting in death normally within 1 to 3 days of ingestion.” The NDA respectfully seeks a correction in the language to reflect the previous studies results of timing of death.	Edited for clarity
Nevada Department of Agriculture (NDA.7)	The NDA requests that the language be corrected to reflect that take is dependent on impacts seen during a year. In addition, the impact that the raven population has on the Desert Tortoise cannot be ignored when discussing effects on other species.	Edited for clarity
Nevada Department of Agriculture (NDA.8)	Ideally, the USFWS would evaluate and adopt an Adaptive Management Alternative using current population numbers and science.	See response to NACO.3

White Pine County (WPC.1)	The County was surprised to find that the DEA did not cite any of the recent publications by Dr. Pete Coates with the US Geological Survey (USGS). Dr. Coates has made several public presentations to State Boards and Commissions that make it clear the impact ravens are having on Sage-grouse populations. His findings suggest that even in quality habitat, raven densities over a given threshold can have negative impacts on Sage-grouse populations. The County would recommend that the Service review and incorporate these findings into its Final EA	See response to NACO.3
White Pine County (WPC.2)	However, the "Maximum Take" of 19,042 ravens per year is extremely conservative in that it is based on the 2013 population estimate (190,000 ravens) rather than the 2023 estimate (370,000 ravens). Either the maximum take in this alternative should be increased to 40,000 ravens per year, or the Service should evaluate another alternative specific to maximizing Sage-grouse protection.	We acknowledge that our PTL modeling is conservative, however it is consistent with USDA 2020. Current take requests do not reach the maximum take alternative levels.
White Pine County (WPC.3)	A "Sage-grouse Protection" alternative should be developed with the Nevada Department of Wildlife (NDOW) and Nevada Wildlife Service (NWS) to determine the number of ravens that would need to be taken to get population densities in key Sage-grouse areas below the critical density threshold within the next five (5) years.	See response to NACO.3
White Pine County (WPC.4)	None of these alternatives should be based on current funding and capacity to carry out raven removal. Both NDOW and NWS have indicated in public meetings that the limiting factor to raven removal is the limited take allowed by the Service, and that funding and capacity could be ramped up if the take permit were increased.	See response to NACO.6
Sagebrush Ecosystem Council (SEC.1)	We strongly recommend the implementation of a Conservation Order or something similar against Common Ravens in Nevada in order to reduce the population. By reducing the population size of raven to a manageable level, we can begin to address the negative impact they have on sensitive wildlife species and restore the ecological balance in the region.	See response to NACO.3
Eureka County (EC.1)	We are, however, puzzled why the FWS did not complete the analyses and develop an adequate alternative to adequately and scientifically address raven control in a way to offset raven threats to sage grouse.	See response to NACO.3

Eureka County (EC.2)	We assert it is inappropriate and misguided to use 2013 raven population data of 190,000 as a baseline for considering various take permit alternatives in the EA when the EA itself documents “population of ravens in the United States is currently estimated at 2.5 million individuals, with 370,000 estimated in NV (Partners in Flight 2023)” and notes that the population could be as high as 590,000. At a minimum, the FWS should base its analyses and maximum take on current 2023 population estimates.	See response to NNOW.11
Eureka County (EC.3)	We request a new alternative or revising Alternative 2 to ensure sage grouse benefit where the focus is instead on the density of <0.40 per km2 in sage grouse habitat areas regardless of how many ravens while also considering the overall raven population in the state (based on more current raven numbers).	See response to NACO.3
Eureka County (EC.4)	Next, Eureka County is troubled by the assertion in the EA that the Nevada Department of Wildlife (NDOW) and USDA Nevada Wildlife Services (WS) have only requested take up to 11,000 ravens per year as analyzed in Alternative 1...Please follow up with NDOW and WS to make sure their perspective is accurately reflected.	See response to NACO.6
Eureka County (EC.5)	We argue the EA as currently drafted is inconsistent State policy as formalized by the State Legislature in 2015 through Assembly Joint Resolution No. 2 “Urging the United States Congress and the United States Fish and Wildlife Service to take certain actions to reduce the impact of common ravens on the greater sage grouse and desert tortoise populations in this State.” The resolution outlines the public policy in Nevada that ravens be controlled in a way to protect sage grouse, desert tortoise, and other sensitive species. The FWS must strive for consistency with this policy or document why it cannot be met and what efforts will be done to address the inconsistency.	See response to NACO.7
Eureka County (EC.6)	However, as noted above, the current EA and all alternatives presented are inadequate to reverse the declines in sage grouse caused by ravens. We kindly request FWS address these inadequacies before issuing a Final EA, FONSI, and Decision Record.	See response to NACO.3

N-4 State Grazing Board (SGB.1)	...the current EA and all alternatives presented are inadequate to reverse the declines in sage grouse caused by ravens. We kindly request FWS address these inadequacies before issuing a Final EA, FONSI, and Decision Record.	See response to NACO.3
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# **Appendix A: Depredation Standard Operating Procedures Issuance Criteria and Justifications Overview**

Approved by MB Leadership Team: October 5, 2017

## **1. What is Depredation?**

Depredation is physical damage or physical loss caused by birds. Depredation permits are intended to provide short-term relief and/or reinforcement of non-lethal measures while the applicant progresses towards implementing a long-term, non-lethal solution to eliminate or significantly reduce the problem. The best place to start for questions on depredation is the Frequently Asked Questions with the Depredation Permit application form (<https://www.fws.gov/forms/3-200-13.pdf>).

## **2. What types of Damage can Depredation Permits be Authorized for?**

Depredation is categorized into four broad categories: (a) Agricultural Damage (see #4), (b) Private or Public Property Damage (see #5), (c) Threats to Human Health and Safety (see #6), and (d) Threats to Recovery of Protected Wildlife (see #7). Each of these categories are expanded below. Each category and subcategory below is further expanded in the Examiner-Level portion of the Depredation Standard Operating Procedure (SOP).

## **3. How are Depredation applications reviewed?**

The Depredation Regulation (50 CFR 21.41) does not specify issuance criteria. However, the Migratory Bird permit program has drawn upon the relevant treaties, statutes, regulations, and policy<sup>1</sup> as well as the professional expertise of USDA-Wildlife Services to establish a consistent practice for reviewing Depredation permit applications.

We also use the General Permit Procedures (50 CFR 13.21). Under part 13.21(b), we must receive a properly executed application prior to issuance of a permit. For depredation, this includes (a) the description of the damage to people, property, or wildlife (b) the non-lethal methods that have been implemented, (c) the species, number, method, and location of take proposed, (d) the long-term, non-lethal solution proposed, and (e) the recommendation provided by Wildlife Services ("Form 37").

Once an application is determined to be complete, it must be reviewed for disqualifying factors (13.21(c)). The most common conditions a Depredation permit would not be issued are:

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<sup>1</sup> The Depredation (50 CFR 21.41) regulation implies a preference for non-lethal alternatives, for example, no permit is required to scare or harass birds (21.41(a), but killing must be specifically authorized on the permit (21.41(c)(1)). Additionally, the regulatory requirement for implementation of non-lethal methods is found in Depredation Orders (21.43-44; 21.49-52). Service policy documents relating to Depredation activities also require nonlethal implementation prior to lethal take, such as the Policy on Issuing Permits to Take Raptors with the Use of Pole Traps as well as the Service Manual 724 FW 6 Depredating Birds at Fish Culture Facilities. The Service policy specific to Depredation Permits is further outlined on the Application Form (3-200-13), associated frequently asked questions, and permit issuance past practice. This OMB approved form requests the applicant to provide information on the nonlethal deterrents tried and a long-term strategy for the combination of lethal and nonlethal deterrent measures.



- a. “The applicant has failed to demonstrate a valid justification for the permit and a showing of responsibility” (13.21(b)(3)); and
- b. “The authorization requested potentially threatens a wildlife or plant population” (13.21(b)(4)).

It is possible for an application to be complete but fail to demonstrate a valid justification. For example, failure to implement reasonable nonlethal methods or the proposed solution is not likely to reduce the depredation problem. Under the Migratory Bird Treaty Act, we must also determine that take is compatible with the preservation of the species. These criteria must be met prior to issuance.

More information on how applications are reviewed, including expectations for different types of depredation, can be found in the Examiner-Level portion of this SOP.

## **4. What is Agricultural Damage?**

Agricultural damage is damage or loss to commercial agriculture (for hobby or private agriculture see Property Damage). We use the USDA definition of “Farm or ranch” when considering whether something constitutes agricultural loss. A farm or ranch is defined as “any place from which \$1,000 or more of agricultural products were raised and sold or would have been raised and sold during the previous year, but for an event beyond the control of the farmer or rancher” (7 CFR § 4284.902 Definitions). If all reasonable non-lethal methods have been implemented, permits may be considered for agricultural damage, including:

- A. Crop Damage: Damage to crop fields (e.g. wheat, rice, sod), fruit shrubs or vines (e.g. grapes, blueberries), and fruit or nut trees (e.g. cherry, olive, hazelnut).
- B. Animal Health & Loss: protection of herd animals (e.g. cattle, sheep), poultry, and consumption of livestock feed.
- C. Aquaculture: both freshwater and saltwater. For private ponds, see Property Damage (#5).
- D. Enclosed game animals raised for sale: both native (e.g. quail, waterfowl, rabbit) and non-native species (e.g. pheasant).

## **5. What is Private & Public Property Damage?**

Property damage is damage or loss associated with an individual or entity’s property. If all reasonable non-lethal methods have been implemented, permits may be considered for property damage, including:

- A. Building and Infrastructure Damage: private residences, commercial buildings, infrastructure, and public property
- B. Vehicle and Equipment Damage: cars, boats, construction equipment, etc.
- C. Vegetation: landscaping and ornamental plants, includes golf course turf damage

D. Animals: display animals (such as zoo exhibits)

E. Permits are not available for animals (e.g. hobby, pet, etc.) raised free-range or otherwise released in the wild.

## **6. What Constitutes a Threat to Human Health and Safety?**

A threat to human health and safety includes the following (non-lethal requirements may vary based on the degree of emergency):

A. Airports (special permit type code: DPRDAP)

B. Disease and Contamination Threats: most commonly landfills, but includes disease outbreaks, fecal matter overloading, and disease threats from birds nesting in buildings or on structures. Supporting documentation from the State or County Health Department may be required.

C. Safety Emergencies: nests blocking navigational aids, impeding 911 capabilities, fire hazards, and other emergencies.

D. Safety Non-Emergency: these are uncommon but include situations such as walkways unsafe due to slippery fecal buildup or being chased by birds.

E. Birds Attacking Humans: rarely authorized unless injury to human(s) can be demonstrated and all options have been exhausted.

## **7. What Constitutes a Threat to the Recovery of Protected Fish and Wildlife?**

A depredation permit may be issued to assist in the recovery of native protected fish and wildlife species, such as species listed as endangered, threatened, or of special concern. Species must be native to the location and the population must be important to recovering or maintaining a sustainable population of that species. A sustainable population is a population that is able to maintain a long-term trend with numbers above a level that would not result in a major decline or cause a species to be threatened or endangered. Permits may not be issued under this justification for abundant or non- native species, nor to protect resources for recreational purposes (i.e. stocking recreational fisheries). Take must be to address a depredation problem and not be for population control of the depredating species.

A. Protected wildlife may include species federally or state listed as threatened, endangered, or of conservation concern. If not listed, the applicant must justify why the species (or population) requires protection. Protected wildlife may be enclosed or free-roaming.

B. Abundant & Non-native Species: A private property damage justification may be considered but not under recovery of protected wildlife.

C. Recreational Use: A depredation permit may not be issued to protect wildlife for recreational use purpose.

## **8. Is a depredation permit appropriate for situations with no physical damage or physical loss?**

No. Depredation permits are intended to resolve physical damage, physical loss, or threats to safety or wildlife. Economic loss can be used as information to illustrate the scope and scale of physical loss. However, a depredation permit cannot be issued to cover solely economic loss, such as delays in construction timelines.

For situations where the damage or loss is solely economic, and no physical damage or physical loss occurs, applicants may apply for other permit types. For more information, see the Nest FAQ.

## **Appendix B: Comment Letters on the January 2024 Draft EA**

# Elko County's Comment Regarding the Draft Environmental Assessment for Depredation Permits for Common Raven Removal in Nevada

Prepared by:

Curtis F. Moore  
Elko County Natural Resources Director, M.S., J.D.

## Introduction

Elko County is a county in northeastern Nevada. Nearly 73% of Elko County is administered by Federal Agencies. The land managed by the US Forest Service is on the Humboldt-Toiyabe National Forest, and the rest is managed by the Bureau of Land Management or by local tribes. Elko County's economy is heavily dependent on extractive industries, as well as livestock grazing and outdoor recreation.

Because so much of Elko County's economy is dependent on the health of and access to public lands, Elko County has a vested interest in the conservation of the Greater Sage Grouse (GRSG), and has created its own sage grouse management plan that includes recommendations and policies concerning predator management.

## Increased Raven Populations Would Result in a Net Loss of Sage Grouse

The Draft EA states that “[u]sing a conservative model based on a 2013 estimate of raven populations, we estimated that we could authorize lethal take for up to 19,042 total ravens per year without causing a decline in the NV population.” This implies that either of the other options would result in an increase in the raven population.

Many human activities subsidize raven population growth.<sup>1</sup> Section 6.4.1.1 of the Elko County Sage Grouse Management Plan calls for reducing man-made perches, installing anti-perch devices on power poles, and reducing other available subsidies to reduce the raven population by providing less suitable habitat.

However, this does not address the ravens that are currently on the range, or remove ravens from lekking areas. That is why Elko County also urges managing agencies to use lethal predator control on un-endangered species like ravens.

Ravens are a major factor in sage grouse nest failure. 51% of sage grouse nests fail, and of those 83% fail because of predation.<sup>2</sup> Ravens have been observed to be responsible for 35% of nest depredations.<sup>3</sup> This is further observed by other researchers, who found that increasing raven

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<sup>1</sup> Boarman, W. I. (2003). Managing a Subsidized Predator Population: Reducing Common Raven Predation on Desert Tortoises. *Environmental Management*, 32(2), 205–217. doi: 10.1007/s00267-003-2982-x

<sup>2</sup> Thuy-Vy D. Bui, John M. Marzluff, Bryan Bedrosian, Common Raven Activity in Relation to Land Use in Western Wyoming: Implications for Greater Sage-Grouse Reproductive Success, *The Condor*, Volume 112, Issue 1, 1 February 2010, Pages 65–78, <https://doi.org/10.1525/cond.2010.090132>

<sup>3</sup> Conover, M. R., & Roberts, A. J. (2016). Predators, predator removal, and sage-grouse: A review. *The Journal of Wildlife Management*, 81(1), 7–15. doi: 10.1002/jwmg.21168

abundance across a suite of ecosystems facilitates top-down ecological pressure on the reproductive success of prey species at lower trophic levels, including a sagebrush indicator species of high conservation concern in western North America (e.g., greater sage-grouse, *Centrocercus urophasianus*; Conover & Roberts, [2017](#)).”<sup>4</sup>

Lethal control has been shown to increase sage grouse nest success in Nevada.<sup>5</sup> By increasing the number of take permits available, the USFWS will be giving managing agencies tools that have been shown to be effective in increasing sage grouse nest success.

Because keeping the raven population at least at its current level is a step toward lowering potential habitat for ravens, especially near lekking areas, it is Elko County’s position that the USFWS should select alternative 2, and issue permits for up to the potential lethal take maximum.

## **Conclusion**

Increasing raven populations will result in higher nest failure rates for sage grouse. There is only one alternative that is predicted to keep raven populations at their current levels. Elko County urges the USFWS to select alternative 2, which will be in the best interest of the sagebrush ecosystem and the animals who depend on it.

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<sup>4</sup> Oneil, S. T., Coates, P. S., Brussee, B. E., Jackson, P. J., Howe, K. B., Moser, A. M., ... Delehanty, D. J. (2018). Broad-scale occurrence of a subsidized avian predator: Reducing impacts of ravens on sage-grouse and other sensitive prey. *Journal of Applied Ecology*, 55(6), 2641–2652. doi: 10.1111/1365-2664.13249

<sup>5</sup> Coates, P. S., & Delehanty, D. J. (2004). The effects of raven removal on sage grouse nest success. *Proceedings of the Vertebrate Pest Conference*, 21. Retrieved from <https://escholarship.org/uc/item/9mm5x4c3>



## EUREKA COUNTY BOARD OF COMMISSIONERS

Rich McKay, Chairman ♦ Mike Sharkozy, Vice Chair ♦ Marty Plaskett, Member  
*PO Box 540, 10 South Main Street, Eureka, Nevada 89316*  
*Phone: (775) 237-7211 ♦ Fax: (775) 237-4610 ♦ [www.co.eureka.nv.us](http://www.co.eureka.nv.us)*

February 23, 2024

U.S. Fish and Wildlife Service  
Pacific Southwest Region  
Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825

Via email to [Permitsr8mb@fws.gov](mailto:Permitsr8mb@fws.gov)

RE: Draft Environmental Assessment, Depredation Permits for Common Raven Removal in Nevada

To Whom It May Concern:

The Eureka County Board of Commissioners appreciates the opportunity to provide comments on the Draft Environmental Assessment (EA), Depredation Permits for Common Raven Removal in Nevada.

Eureka County's socioeconomic fabric is woven with access to and use of natural resources. Over 80% of Eureka County's land is federally managed land. Nearly all of our community's viability is tied to uses on or in concert with federally managed land.

We believe that proper management of predators, including ravens, serves to benefit all multiple uses, needs, and requirements of society. As Nevada residents with firsthand knowledge of the absolute need to provide food, fiber, minerals, and safety to an ever-consuming world, we believe raven depredation is necessary and imperative. Raven impacts to sage grouse populations have wide ranging effects on our agriculture and mining enterprises because of land use restrictions tied to sage grouse management requirements. Additionally, should the sage grouse be listed under the Endangered Species Act (ESA), there would be devastating impacts to our local economy and social stability.

We acknowledge the EA documenting the "significantly increasing trend" in raven populations and "five-fold increase in the number of ravens in Nevada" and the scientifically proven fact that ravens are the "most significant limiting factor to the recovery of sensitive species in Nevada." We are, however, puzzled why the FWS did not complete the analyses and develop an adequate alternative to adequately and scientifically address raven control in a way to offset raven threats to sage grouse.

We assert it is inappropriate and misguided to use 2013 raven population data of 190,000 as a baseline for considering various take permit alternatives in the EA when the EA itself documents "population of

ravens in the United States is currently estimated at 2.5 million individuals, with 370,000 estimated in NV (Partners in Flight 2023)” and notes that the population could be as high as 590,000.- At a minimum, the FWS should base its analyses and maximum take on current 2023 population estimates.

Of the alternatives offered, Eureka County believes Alternative 2 Lethal Take Maximum should be the preferred alternative. In fact, even this alternative will not provide the take necessary to address raven impacts to sage grouse statewide. Under all of the alternatives, including Alternative 2, raven population would continue to grow or, at its best, stabilize at its already unnatural and inflated population level and density.

The current, best available science has determined that exceeding a threshold of 0.40 ravens per km<sup>2</sup> in sage grouse habitat results in decreases in sage grouse population.<sup>1</sup> It has also been documented that significant portions of high value sage grouse habitat in Nevada have raven population densities in excess of the critical threshold of 0.40 ravens per km<sup>2</sup>. To ensure ravens are managed at numbers less than this threshold will require much more maximum take than even the Lethal Take Maximum alternative currently offered. USGS’s research highlighted the need to instead focus on raven density per km<sup>2</sup> (<0.40) rather than overall numbers, at least related to sage grouse, and focused on first protecting “core” sage grouse populations where raven predation is a primary threat. USGS has developed a tool to help narrow down where this would be. We request a new alternative or revising Alternative 2 to ensure sage grouse benefit where the focus is instead on the density of <0.40 per km<sup>2</sup> in sage grouse habitat areas regardless of how many ravens while also considering the overall raven population in the state (based on more current raven numbers). There should be preference to completing raven removal in the highest priority habitat areas or where there is other habitat work taking place.

Next, Eureka County is troubled by the assertion in the EA that the Nevada Department of Wildlife (NDOW) and USDA Nevada Wildlife Services (WS) have only requested take up to 11,000 ravens per year as analyzed in Alternative 1. Eureka County has representation at a recent meeting where it was stated that additional capacity would be needed to address an increase in take. The statement was that at current capacity, they could only complete the work under an increase as noted in Alternative 1. Should an adequate take to benefit sage grouse be authorized, we assert that the State of Nevada and USDA WS would both be able to step up, with other partners including counties and agricultural groups, to ensure funding and capacity to do the necessary work. Please follow up with NDOW and WS to make sure their perspective is accurately reflected.

Additionally, we note FWS obligation to analyze and include discussion in the EA regarding consideration of and inconsistencies or conflicts with state and local government plans and policies according to 40 CFR 1502.16(a)(5) and 40 CFR 1506.2(d) and the March 16, 1981 *Memorandum for Federal NEPA Liaisons, Federal, State, and Local Official and Other Persons Involved in the NEPA Process*, Questions

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<sup>1</sup> Coates, P.S., et. al. 2020. Broad-scale impacts of an invasive native predator on a sensitive native prey species within the shifting avian community of the North American Great Basin. *Biological Conservation*, 243, <https://doi.org/10.1016/j.biocon.2020.108409>



23b and 23c. NEPA documents are to “include discussions of...possible conflicts between the proposed action and the objectives of...local land use plans, policies and controls for the area concerned” and “discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law.”

We argue the EA as currently drafted is inconsistent State policy as formalized by the State Legislature in 2015 through Assembly Joint Resolution No. 2 “Urging the United States Congress and the United States Fish and Wildlife Service to take certain actions to reduce the impact of common ravens on the greater sage grouse and desert tortoise populations in this State.” The resolution outlines the public policy in Nevada that ravens be controlled in a way to protect sage grouse, desert tortoise, and other sensitive species. The FWS must strive for consistency with this policy or document why it cannot be met and what efforts will be done to address the inconsistency.

Regarding local, Eureka County plans and policies that must be considered, we highlight below language from our Master Plan and County Code, word-for-word, for consideration and consistency:

- Eureka County Master Plan, Natural Resources and Federal and State Land Use Element:
  - Page 6-24 - Coordinate with the Eureka County Wildlife Advisory Board, Eureka County Natural Resources Advisory Commission, Nevada Department of Wildlife, affected private property interests, lessees and permittees to develop specific wildlife population targets, harvest guidelines, depredation mitigation and guidelines for future site specific management plans affecting upland, water fowl and big game habitat.
  - Page 6-25 - Initiate cooperative studies with willing private land owners, of wildlife depredation and related concerns regarding wildlife habitat on private land.
  - Page 6-25 - Develop records of wildlife losses to predators and support predator control efforts designed to protect specified wildlife species.
  - Page 6-26 - Document the incidents of wildlife depredation and extent of game animal harvest in designated management areas of both land and wildlife management agencies.
  - Page 6-26 - Track the incidents and disposition of wildlife depredation on private lands and property.
- Eureka County Code, Title 9, Chapter 30.060(G):
  - Management of wildlife, including fish, game animals, non-game animals, predatory animals, sensitive species, Threatened and Endangered Species, under all jurisdictions whatsoever, must be grounded in peer-reviewed science and local input. Wildlife management plans must identify and plan for mitigation of negative impacts to local economies, private property interests and customary usage rights.
  - Eureka County supports wildlife management that:
    - a. is responsive to the County Wildlife Advisory Board, the Natural Resources Advisory Commission, and the Board of County Commissioners;
    - b. enhances populations of game and non-game species native to Eureka County;

- c. recognizes that enhancing non-native game and non-game species may negatively impact native species and rangeland and forest ecosystems;
  - d. increases wildlife numbers where practicable and not in conflict with existing economic uses or ecosystem health;
  - e. avoids managing wildlife at population levels that exceed those reported in historical records and established by peer-reviewed scientific investigation;
  - f. recognizes that large game animals compete for forage and water with other economic uses;
  - g. recognizes that federal agencies are mandated to maintain or improve conditions on federal forests and ranges;
  - h. recognizes that wildlife damage mitigation may encumber existing interests and properties to future damages.
- Eureka County will actively participate in wildlife management decisions that affect the welfare of its citizens via state wildlife planning efforts and county, state and federal land use planning. Eureka County will work to ensure proper implementation of wildlife plans.
  - To maintain agriculture as a productive part of the local economy and to enhance the environment for ecologically and economically important wildlife, Eureka County supports sound predator control programs.

In conclusion, Eureka County is grateful of FWS acknowledgment of the need to increase the lethal take permits for ravens. However, as noted above, the current EA and all alternatives presented are inadequate to reverse the declines in sage grouse caused by ravens. We kindly request FWS address these inadequacies before issuing a Final EA, FONSI, and Decision Record.

Sincerely,



Rich McKay, Chairman  
Eureka County Board of Commissioners

cc: Eureka County NRAC

Jesse Hill, Chair  
Tom Hoss, Vice Chair  
Ken Tipton, Commissioner  
Ron Cerri, Commissioner  
Tom Hoss, Commissioner  
Mark Evatz, Commissioner

Humboldt County Courthouse  
50 West Fifth Street Room 205  
Winnemucca, Nevada 89445

## Humboldt County, Nevada



February 20, 2024

To: U.S. Fish and Wildlife Service  
Pacific Southwest Region Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825

From: The Board of County Commissioners  
Humboldt County  
Courthouse Room 205  
50 W. 5<sup>th</sup> Street  
Winnemucca NV 98445

Submitted via: [PermitsR8MB@fws.gov](mailto:PermitsR8MB@fws.gov)

RE: Draft Environmental Assessment: Depredation Permits for Common Raven Removal in Nevada, January 24, 2024 (U.S. Fish and Wildlife Service).

To Whom it May Concern:

The U.S. Fish and Wildlife Service (FWS) is considering updating the number of Common Raven (*Corvus corax*; raven) take permits it annually issues in the state of Nevada for the purpose of “protecting livestock, agricultural resources, sensitive wildlife, and human health and safety.” EA, p. 1. The FWS has issued its Draft Environmental Assessment: Depredation Permits for Common Raven Removal in Nevada (“the EA”) to analyze the impacts of three alternatives—one “maximizing” raven take permits to 19,042, one modestly increasing take permits to 11,000, and one (the No Action Alternative) which would issue take permits at the current level (5,000).

Humboldt County's economy, custom and culture, and valued way of life depends heavily on the ongoing use and enjoyment of the surrounding public lands. Economic and culturally important land uses include livestock grazing, mining, and many forms of recreation. These uses are in jeopardy due to the significant decline in Greater Sage-grouse (GRSG) populations; this species has been considered, and is likely to be reconsidered, for a listing under the Endangered Species Act (ESA). While recent years have seen unprecedented collaborative conservation efforts from the Bureau of Land Management (BLM), Nevada Department of Wildlife (NDOW), Nevada Sagebrush Ecosystem Technical Team (SETT), local working groups, industries, and individual landowners, GRSG numbers continue to decline.<sup>1</sup> Additional efforts must be made to reverse this trend. Absent such efforts, a listing of the GRSG under the ESA is not unforeseeable and would cause incalculable negative impacts to Humboldt County's economy and culture by restricting multiple uses on the public lands. It is well established that ravens are overpopulated in Nevada and their numbers continue to increase unchecked.<sup>2</sup> Ravens are also the primary GRSG predator in Nevada and are known to be driving down the GRSG's dangerously declining populations.<sup>3</sup> Nevada's raven overpopulation has historically been driven by

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<sup>1</sup> According to a 2021 U.S. Geological Survey study, Greater Sage-grouse populations across the West have declined significantly over the past six decades, dropping 80% since 1965, and another 40% since 2002. See Coates, P.S., Prochazka, B.G., O'Donnell, M.S., Aldridge, C.L., Edmunds, D.R., Monroe, A.P., Ricca, Gregory, M.A., Wann, T., Hanser, S.E., Wiechman, L.A., and Chenaille, M.P. *Range-wide Greater Sage Grouse Hierarchical Monitoring Framework: Implications for Defining Population Boundaries, Trend Estimation, and a Targeted Annual Warning System*. U.S. Geological Survey Open File Report 2020-1154, 2021.

<sup>2</sup> "Raven abundance has tripled in the past 40 years throughout North America (Sauer et al. 2004), and increased as high as 1,500% since the 1960s in portions of the western United States (Boarman 1993, Sauer et al. 2004)." Coates, P.S., Spencer Jr., J.O., and Delehanty, D.J. *Efficacy of CPTH-Treated Egg Baits for Removing Ravens*. Human-Wildlife Conflicts 1(2):224-234, Fall 2007, p. 226.

"Our findings suggest that over the past 53 years, raven distributions have expanded across North America and their populations have increased throughout the western and central United States and Canada, while their distributions have expanded across North America. Whether historically common, rare, or absent, raven abundance has increased severalfold over historic abundances." Harju, Seth M., Peter S. Coates, Seth J. Dettenmaier, Jonathan B. Dinkins, Pat J. Jackson, Michael P. Chenaille. *Estimating trends of common raven populations in North America, 1966-2018*. Human-Wildlife Interactions 15(3):248-269, Winter 2021.

<sup>3</sup> "Ravens have been described as one of the most significant limiting factors to the recovery of sensitive species in Nevada. Not only do ravens predate nests and chicks, but also indirectly affect sage-grouse through habitat alteration. Anthropogenic development has supported a further increase in ravens and has made previously suitable habitat inadequate for sage-grouse. Other sensitive wildlife species are likely impacted in a similar fashion." WS-EA: Section 1.11.5 for natural resources, including Greater Sage-grouse (1.11.5.8, p. 116) and other wildlife species (1.11.5.9, p. 121), as quoted in the EA, p. 3.

"[I]ncreasing raven abundance across a suite of ecosystems facilitates top-down ecological pressure on the reproductive success of prey species at lower trophic levels, including a sagebrush indicator species of high conservation concern in western North America (e.g., greater sage-grouse, *Centrocercus urophasianus*; Conover & Roberts, 2017)." Oneil, S. T., Coates, P. S., Brussee, B. E., Jackson, P. J., Howe, K. B., Moser, A. M., ... Delehanty, D. J. (2018). *Broad-scale occurrence of a subsidized avian predator: Reducing impacts of ravens on sage-grouse and other sensitive prey*. Journal of Applied Ecology, 55(6), 2641-2652. doi: 10.1111/1365-2664.13249.

anthropogenic subsidies (perching sites, roadkill, etc.) in combination with the prohibition on take. However, recent studies show that raven overpopulation has become endemic; excess ravens are no longer dependent on subsidies and can be found even in highly intact, undeveloped landscapes.<sup>4</sup>

Because ravens are under the sole jurisdiction of the FWS under the Migratory Bird Treaty Act (MBTA), the BLM, NDOW, other agencies and landowners are unable to protect GRSG by directly managing raven overpopulation. In over a decade of intergovernmental GRSG conservation efforts, raven overpopulation stands out as the one major impact on GRSG that has not been meaningfully regulated (though much work has been done to reduce raven subsidies). Given the extensive GRSG conservation work that has been accomplished by federal, state, and local agencies and private landowners, it is time for the FWS to meaningfully contribute to GRSG conservation by permitting significant lethal control of ravens, noting that the ESA includes “predator control” as an important conservation measure and “predation” as a reason for listing a species.<sup>5</sup> At this juncture, failing to contribute to GRSG

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“In conclusion, it is probable that direct raven removal increased sage grouse nest success in NE Nevada.” Coates, P. S., & Delehanty, D. J. (2004). The effects of raven removal on sage grouse nest success. *Proceedings of the Vertebrate Pest Conference*, 21. Retrieved from <https://escholarship.org/uc/item/9mm5x4c3>.

“We believe raven removal would be most beneficial for sage-grouse populations that are low in numbers and in areas where subsidized raven densities are high.” Peebles, L. W., Conover, M. R., & Dinkins, J. B. (2017). *Adult sage-grouse numbers rise following raven removal or an increase in precipitation*. *Wildlife Society Bulletin*, 41(3), 471–478. doi: 10.1002/wsb.788.

“Lethal removal of ravens may be a potential mitigating strategy for areas of low sage-grouse nest success.” Dinkins, J. B., Conover, M. R., Kirol, C. P., Beck, J. L., & Frey, S. N. (2016). Effects of common raven and coyote removal and temporal variation in climate on greater sage-grouse nesting success. *Biological Conservation*, 202, 50–58. doi: 10.1016/j.biocon.2016.08.011.

<sup>4</sup> “Wildfire directly destroys sage-grouse habitat and is often considered to have the most profound impact on sage-grouse populations, but the new study suggests that predation as a result of elevated raven numbers is likely more widespread and can impact sage-grouse populations where habitat is still intact.” <https://www.usgs.gov/news/research-spotlight-human-enterprise-brings-more-ravens-great-basin-threatening-greater-sage>

<sup>5</sup> “GENERAL.—(1) The Secretary shall by regulation promulgated in accordance with subsection (b) determine whether any species is an endangered species or a threatened species because of any of the following factors:  
(A) the present or threatened destruction, modification, or curtailment of its habitat or range;  
(B) overutilization for commercial, recreational, scientific, or educational purposes;  
(C) disease or predation;  
(D) the inadequacy of existing regulatory mechanisms; or  
(E) other natural or manmade factors affecting its continued existence.” 16 U.S.C. § 1533(a).

“BASIS FOR DETERMINATIONS.—(1)(A) The Secretary shall make determinations required by subsection (a)(1) solely on the basis of the best scientific and commercial data available to him after conducting a review of the status of the species and after taking into account those efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species, whether by predator control, protection of habitat and

conservation by not lethally managing the raven overpopulation would signal a lack of affirmative intent to conserve the GRSG on the FWS's part.

### 1. Humboldt County's Primary Comment

The FWS has chosen Alternative 1, which would only modestly increase raven take to 11,000 permits annually, as its preferred alternative. The Humboldt County Board of Commissioners (the "Board" or "County") finds that Alternative 1 is inadequate to achieve the primary purpose of the Proposed Action, which is to "protect livestock, agricultural resources, sensitive wildlife, and human health and safety." EA, p. 1. To effectively protect sensitive species (specifically the Greater Sage-grouse and Desert Tortoise), **the Board strongly recommends that the FWS adopt Alternative 2 (with an updated maximum take allowance) in the decision record.** Moreover, the Board recommends that the FWS increase the "maximum take" of ravens to a level that *would* reduce raven overpopulation; the FWS should develop an Environmental Impact Statement (EIS) for that purpose as a replacement for, or subsequent to, this EA.<sup>6</sup>

Our comments below reinforce and provide context for the above recommendation.

### 2. The Purpose and Need for the Proposed Action is unclear. NEPA inadequacy issue.

An EA must briefly and clearly state the "purpose and need" of the proposed action. 40 CFR § 1501.5(c)(2). In identifying the need for the action, the EA must state what problem the proposed action would solve or address. If the purpose and need of the proposed action is not clear, the alternatives cannot be effectively analyzed. In Section 2 "Need for Action" the FWS fails to identify a problem with sufficient clarity to inform an analysis of the alternatives. A reader must connect-the-dots and decode oblique language to figure out what the problem is and why the action is being proposed. This is a failure of NEPA adequacy.

**Remedy:** We recommend that the FWS clearly state that the *purpose* of the proposed action is:

- ❖ To update the number of raven take permits in the State of Nevada.

We recommend that the FWS clearly state that the *need* for the proposed action is:

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food supply, or other conservation practices, within any area under its jurisdiction, or on the high seas." 16 U.S.C. § 1533(b)(1)(A).

<sup>6</sup> Although the FWS does not provide its rationale for this restriction in the EA, all alternatives in the current EA are designed to have *no impact* on raven populations.

- ❖ To reduce the overpopulation of ravens in Nevada and thereby protect sensitive wildlife, human health and safety, livestock, agricultural resources.
- ❖ To be responsive to new raven population data.

3. The FWS Should Seek to Reduce Raven Populations in its Proposed Action.  
**NEPA inadequacy issue.**

In the EA, the FWS replicates the criteria used by USDA Wildlife Services Nevada (“WS-NV”) in its 2020 EA<sup>7</sup> to establish a “maximum take” of ravens that *would not impact* the raven population:

“The Service and WS-Nevada modelled the maximum potential lethal take that could be authorized for the NV raven population **that would result in a stable population** (WS-EA Appendix D).” EA, p. 5.

Describing its “Max Take” alternative (Alternative 2) in the current EA, the FWS states:

“Using a conservative model based on a 2013 estimate of raven populations, we estimated that we could authorize lethal take for up to 19,042 total ravens per year **without causing a decline in the NV population.**” EA, p. 5.

As a matter of NEPA disclosure, the FWS must (but fails to) provide an explanation why it is limiting lethal take across all alternatives to a level that would *not* affect raven overpopulation. In view of explaining the rationale for its proposed action under NEPA, the FWS must also (but fails to) explain how the purpose of the proposed action to protect “livestock, agricultural resources, sensitive wildlife, and human health and safety” (EA, p.1) will be served under any alternative if the alternatives cause no decline in the overpopulation of ravens.<sup>8</sup> Absent persuasive evidence to the contrary (which FWS also fails to provide) we suspect that the goals of the proposed action (protection of sensitive species, livestock, etc.) are inconsistent with and undermined by the restriction the FWS imposes across the alternatives to not affect the raven overpopulation. This incoherence indicates a basic NEPA inadequacy issue, since arguably, all alternatives are restricted in a manner that prevents them from meeting the purpose and need for the action. If this incoherence is only apparent, the

<sup>7</sup> [https://www.aphis.usda.gov/wildlife\\_damage/nepa/states/NV/nv-2020-pdm-final-ea.pdf](https://www.aphis.usda.gov/wildlife_damage/nepa/states/NV/nv-2020-pdm-final-ea.pdf)

<sup>8</sup> Notably, the requirement to not affect the raven population was appropriate for the WS-NV’s Predator Damage Management in Nevada EA, as the purpose of that EA was to analyze alternatives for response strategies for *specific requests* for predator damage control (PDM). However, the current FWS EA addresses a much broader need, which is the general protection of “livestock, agricultural resources, sensitive wildlife, and human health and safety” (EA, p. 1) from the effects of raven overpopulation. In this context, the requirement *not* to reduce raven populations is clearly counterproductive to the purpose and need of the action.



FWS would still have to provide evidence showing that even though the alternatives do not affect raven overpopulation, they can successfully protect sensitive species, etc. No such evidence is provided.

We further note that the FWS *does* have the authority to reduce the overpopulation of ravens, if it wishes to:

“The MBTA gives the Service broad authority to protect birds, but also to regulate their taking as long as their conservation is assured; the issuance of these permits must ensure that authorized take will not potentially threaten raven or other wildlife or plant populations (See 50 CFR 13.21(b)(4)).” EA, p. 2.

Clearly, reducing raven overpopulation to normal levels does not threaten the raven population or the species’ conservation. It is therefore well within the FWS’s *authority*. We further suggest that reducing raven overpopulation is also the *responsibility and duty* of the FWS as administrator of both the MBTA and the ESA—the MBTA was never intended to result in extreme predator overpopulations that contribute to the listing of a prey species (like the GRSG) under the ESA. By allowing such a scenario to play out, the FWS would be failing to rationally and effectively administer these two statutes.

**Remedy:** To accomplish the purpose and need for the action, which is “primarily for the purpose of protecting livestock, agricultural resources, sensitive wildlife, and human health and safety” (EA, p. 1) the action alternatives must propose lethal take limits that would reduce the raven overpopulation. FWS should coordinate with NDOW to develop at least one alternative with raven take limits that will effectively protect Nevada’s GRSG populations. Adding one or more such alternative will likely require the preparation of a subsequent EIS.

4. The EA’s “maximum take” data is misleading. **NEPA inadequacy issue.**  
The EA claims that:

“Using a conservative model based on a 2013 estimate of raven populations, we estimated that we could authorize lethal take for up to 19,042 total ravens per year without causing a decline in the NV population.” EA, p. 5.

Elsewhere in the EA, however, the FWS admits that the 2013 data are no longer accurate; raven populations have expanded by over a third in the past decade:



“The population of ravens in Nevada used in the WS-EA Appendix D modeling is 190,000 individuals (Partners in Flight 2013). **However, it is evident that populations have increased since modeling was completed.** The population of ravens in the United States is currently estimated at 2.5 million individuals, with 370,000 estimated in NV (Partners in Flight 2023).” EA, p. 3.

The FWS has a responsibility under NEPA, as well as the Department of Interior’s Information Quality Guidelines<sup>9</sup> pursuant to the Data Quality Act<sup>10</sup> to “ensure and maximize the quality, objectivity, **utility, and integrity** of Government information disseminated to the public.” (Emphasis added.) Because it bases its “maximum take” number on outdated information, the EA misleads the reviewing public, implying that the “maximum take” is less than it actually is. The word “maximum” is itself inaccurate, since a real maximum based on current population data would be higher. Although the FWS admits that 2023 population data are available, it chooses not to use the current data for establishing a max take limit. Nor does FWS provide any rationale why the current data were ignored. Again, the public must connect-the-dots to figure out that better population data were available, and is left wondering why the 2023 data were not used in this EA. The FWS’s use of an outdated raven population in the EA unacceptably compromises the utility and integrity of the data, the integrity of the analysis, and NEPA’s public review process.

**Remedy:** The EA cannot base a “maximum take” number on outdated data. At a minimum, the FWS should base its “maximum take” on current 2023 population estimates. In addition, and as mentioned in Comment 3 (above), we also find that a “maximum” take for raven permits should reflect the maximum take for sustainably *reducing* raven overpopulation, not *maintaining* raven overpopulation. Without this change, all alternatives arguably fail to meet the purpose and need of the proposed action.

5. The EA misrepresents State and Federal agency views. **NEPA inadequacy issue.**

In support of their selection of Alternative 1 (modestly increasing take permits to 11,000) the FWS repeatedly implies that NDOW and WS-NV join their support of Alternative 1 because these agencies “believe” the modest increase in take permits (to 11,000) will “ensure adequate protection for sensitive species” like GRSG, desert tortoise, etc.:

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<sup>9</sup> [https://www.doi.gov/sites/doi.gov/files/uploads/doi\\_information\\_quality\\_guidelines.pdf](https://www.doi.gov/sites/doi.gov/files/uploads/doi_information_quality_guidelines.pdf)

<sup>10</sup> “...for ensuring and maximizing the quality, objectivity, utility, and integrity of information, including statistical information, disseminated by Federal agencies...” [Sec. 515 of Public L. No. 106-554.]

“NDOW and WS-Nevada have indicated to the Service that in order to provide protection to sensitive species adequate to meet species goals, they could, combined, request lethal take for up to 10,000 ravens per year.” EA, p. 5.

“NDOW and WS-Nevada request to increase the raven take limit from its current threshold of approximately 5,000 ravens per year to 11,000 ravens per year. They believe that this value will ensure adequate protection for sensitive species and other resources such as livestock. Increasing raven populations, along with an increased presence of human activity, can be expected to lead to a greater need for resource protection.” EA, p. 7.

Humboldt County conducted follow-up with both NDOW and WS-NV to determine whether these statements in the EA accurately represent their agency’s views. It is our clear understanding that they do not, and that the above statements misrepresent the assessments of these agencies. Both agencies indicated that significantly more take permits would need to be issued than Alternative 1 allows to protect sensitive species. By misrepresenting the views of NDOW and WS-NV, the EA misinforms the public and fails to meet NEPA adequacy standards.

**Remedy:** The FWS should immediately coordinate with NDOW and WS-NV to ascertain their views on raven population control and sensitive species protection requirements. If the FWS has misrepresented their views in the EA, it should immediately issue a public correction, and extend the comment period to ensure the public has a chance to review accurate information.

## 6. The FWS Failed to Follow its Own Policy in Developing the EA

In determining appropriate levels of raven take for the conservation of GRSG, Desert Tortoise, and other listed or sensitive species, the FWS should follow its own Interagency Policy Regarding the Role of State Agencies in ESA Activities<sup>11</sup> by using the expertise of NDOW:

“Use the expertise of State agencies in designing and implementing prelisting stabilization actions, consistent with their authorities, for species and habitat to remove or alleviate threats so that the listing priority is reduced or listing as endangered or threatened is not warranted. Encourage collaborative conservation planning with State agencies across the range of a species, including, as appropriate, through State Wildlife Action Plans, and work collaboratively with State agencies to facilitate voluntary

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<sup>11</sup> Laws and Policies: Regulations and Policies. Department of Interior, Feb. 22, 2016.

conservation actions on behalf of species **before they reach the point at which they need to be listed as threatened or endangered under the Act.**” (Emphasis added.)

Given the above policy, the FWS clearly should have included NDOW as a cooperating agency on this EA to assist in determining raven take limits that would protect GRSG and Desert Tortoise. (WS-NV should also have had cooperating agency status.) The FWS apparently undertook to write this EA on its own, and managed to misrepresent the views of the agencies it should have included in the process. While we are aware there is no legal requirement for the FWS to invite cooperating agency participation for EAs, substantive and timely involvement of cooperating agencies on EAs is an affirmative means by which the FWS may implement its own policies (see above) as well as comply with the following regulations, directives, and guidance:

- ❖ “Agencies shall involve the public, State, Tribal, and local governments, relevant agencies, and any applicants, to the extent practicable in preparing environmental assessments.”

40 CFR § 1501.5(e) (emphasis added).

- ❖ “The procedures of this section [How to select cooperating agencies] may be used for an environmental assessment.”

43 CFR § 46.225(e)

- ❖ “The Responsible Official **must whenever possible consult, coordinate, and cooperate with relevant State, local, and tribal governments** and other bureaus and Federal agencies concerning the environmental effects of any Federal action within the jurisdictions or related to the interests of these entities.”

43 CFR § 46.155 (emphasis added).

- ❖ “[...] [T]he Secretar[y] of the Interior [...] shall, to the extent permitted by law and subject to the availability of appropriations and in coordination with each other as appropriate [...] carry out the programs, projects, and activities of the agency that they respectively head that implement laws relating to the environment and natural resources in a manner that:

- (i) facilitates cooperative conservation;
- (ii) takes appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources;
- (iii) properly accommodates local participation in Federal decisionmaking; and
- (iv) provides that the programs, projects, and activities are consistent with protecting public health and safety...

Executive Order 13352—Facilitation of Cooperative Conservation. Federal Register, Vol. 69, No. 167. Monday, August 30, 2004 (emphasis added)

**Remedy:** The FWS should invite NDOW and WS-NV to be cooperating agencies and rewrite the EA with substantive input from both, ensuring that the FWS's Interagency Policy Regarding the Role of State Agencies in ESA Activities is fully implemented in this process.

7. The EA is inconsistent with a Nevada State Legislature resolution on raven control.

In 2015, the Committee on Natural Resources, Agriculture, and Mining of the Nevada State Legislature passed Assembly Joint Resolution No. 2 “Urging the United States Congress and the United States Fish and Wildlife Service to take certain actions to reduce the impact of common ravens on the greater sage grouse and desert tortoise populations in this State.”<sup>12</sup> The resolution states the will of Nevada’s elected governing body that the overpopulation of ravens be controlled to protect GRSG and the Desert Tortoise from undue raven depredation.

**Remedy:** The FWS should seek consistency with the Nevada Legislature’s resolution by issuing raven take permits sufficient to protect the GRSG and the Desert Tortoise from undue depredation.

8. Summary

While Humboldt County appreciates the FWS’s taking the step of increasing permits for lethal take of ravens, the current range of alternatives is insufficient to have a significant effect on the problems the FWS says it wants to address—in particular, protecting special status species (like the GRSG). By selecting Alternative 1 as the

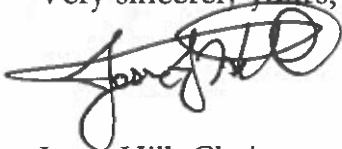
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<sup>12</sup> [https://www.leg.state.nv.us/Session/78th2015/Bills/AJR/AJR2\\_EN.pdf](https://www.leg.state.nv.us/Session/78th2015/Bills/AJR/AJR2_EN.pdf)

preferred alternative, the FWS exacerbates this shortcoming. Alternative 1 is little more than a *pro forma* exercise for good optics; it is not an effective remedy for real-world problems. Instead, the FWS must take decisive steps to address raven overpopulation. At a bare minimum, the FWS should select Alternative 2 as its preferred alternative, ensuring that the “maximum take” of 19,042 is updated to reflect 2023 raven populations. This Board further recommends that the FWS coordinate with NDOW (as per the FWS’s Interagency Policy Regarding the Role of State Agencies in ESA Activities) to define “maximum take” of ravens to reflect a level that would sustainably reduce raven overpopulation sufficient to protect the GRSG, not maintain raven overpopulation. The FWS should therefore develop an Environmental Impact Statement (EIS) that analyzes alternatives for reduction of raven overpopulation as a replacement for, or subsequent to, this EA.

We thank FWS for the opportunity to comment on this EA. If the County can provide any additional clarification of the above comments, please do not hesitate to contact County Manager Don Kalkoske or County Public Lands Consultant Andy Rieber.

Very sincerely yours,

A handwritten signature in black ink, appearing to read "Jesse Hill", with a large circular flourish at the end.

Jesse Hill, Chairman  
Humboldt County Board of Commissioners



# LANDER COUNTY

COUNTY MANAGER

BARTOLO (Bert) RAMOS

50 State Route 305

Battle Mountain, NV 89820

(775) 635-2885

February 21, 2024

Filed electronically: <mailto:PermitsR8MB@fws.gov>

Lander County respectfully submits comments on the Draft Environmental Assessment - Depredation Permits for Common Raven Removal in Nevada

## Common Raven Populations and Greater Sage Grouse

The Common Raven (Raven) have been documented to prey on Greater Sage Grouse (GRSG) chicks and eggs. As you know, there has been concerted efforts by many parties to turn around the imperiled populations of the Greater Sage Grouse. An Environmental Assessment contemplating increase in lethal measures of any wildlife/avian species must provide robust science that directs the agency to take such measures. In our opinion, such science was not found when reading the Common Raven Depredation Permit EA. The need for such action should be clear and backed up with data. The FWS consideration of increases in depredation permits was not linked to a need. The number of ravens killed vs. reduced damages as a result from past issuance of permits should have been provided for assessment of effectiveness or lack thereof. The number of permits sought that were rejected because quotas were reached should have been included to show the need for more deprivation permits to be granted because of any of the Appendix A reasons provided for issuing deprivation permits.

The EA does not provide an alternative that focuses on the reduction of the Raven populations in Priority Habitat Areas for GRSG. If the increase in Raven populations and decrease in GRSG populations are intrinsically linked (which was not apparent in the Draft EA), the focus of Raven culling in Priority Habitat Areas would be a preferred alternative. This alternative was not an option.

The FWS explains that Raven numbers have significantly increased due to the anthropogenic food sources that are provided to these adaptable birds. The Ravens are feasting on other food sources and increasing in population because of these easy to find calories.

The FWS needs to explain how these increased populations that have adapted to other foods are still a significant predator to Greater Sage Grouse. If this is true, this EA should focus on Raven takes in Priority Habitat areas with takes that would negatively affect the number of Ravens in that area. The options put forth apparently are not linked to any metrics that will assist the recovery of GRSG.

Raven takes associated with Appendix A: Depredation Standard Operating Procedures Issuance Criteria and Justifications Overview

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50 State Route 305 S. ◀ ▶ Battle Mountain, NV 89820

Phone: (775) 635-2885 ◀ ▶ Fax: (775) 635-3334 ◀ ▶ Email: [bramos@landercountynv.org](mailto:bramos@landercountynv.org)

Excerpt from the EA Notice: "While this EA considers the potential environmental impacts of permitting actions, the Service will evaluate each permit application individually and make future decisions based on the criteria set forth in 50 C.F.R. §§ 21.100 (depredation), 21.73 (scientific collection), 21.95 (special purpose), and any future regulations that allow for lethal take."

According to Appendix A, the four categories in which to apply for depredation permits must show a clear loss associated with the application for a depredation application. Each application is analyzed and a decision is made based on the above criteria and not the EA being contemplated. The need for this EA is unclear as increased numbers of Raven takes is not justified in any meaningful way.

The benefits to all of the alternatives put forth is unclear. It is plainly stated in each of the alternatives that there would not be a change in Raven populations. If Ravens are to be killed, one would think the goal would be to reduce their population in meaningful numbers to achieve a response to the degradation that Ravens are causing. If the population is affected at the permit level for damages, this EA is not needed, unless other data is provided to show the current number of Raven takes allowed does not meet the needs for damage depredation permits pursued.

#### Landfills, Public Health, Airports

Data should be provided for assessing public health concerns for ravens vs. seagulls and other corvids at landfills and other places of concern. Lethal removal of birds might be expanded to other species if control measures cannot be controlled by other methods. If Ravens are posing larger risks at airports than other avian species, this anomaly should be presented for the public to comment on increased takes of this species of bird needing lethal means for conflict resolution.

#### Livestock and Property Damage

If the case is made that eligible livestock owner depredation permit applications are denied because the limit on allowable Raven takes have been met then a NEED has been shown to increase the number of Raven depredation permits issued. If this scenario exists, it should be presented as a need for this EA. Additionally, Lander County recommends that livestock owners be surveyed to attest damages incurred from other corvids in comparison to damage from solely Ravens. The damage incurred from crows and magpies might surprise the FWS.

#### Bigger Picture that deserves Attention

Although outside the scope of this action, and likely this comment is discounted for that reason, Lander County must emphasize that FWS should concentrate on its role in evaluating new actions that affect GRSG habitat in a detrimental way. A positive example, would be promoting siting transmission lines and new disturbances outside of GRSG Priority Habitat Areas. FWS should take a stand on the plight of GRSG in a more meaningful way to recover this species. Without data to back up the Alternatives in this EA, the exercise has the appearance of "window dressing" that the FWS is doing something to affect GRSG numbers.

Respectfully,

Pam Harrington

Natural Resource Officer

Lander County, Nevada



## N-4 State Grazing Board

P.O. Box 461, Panaca, Nevada 89042  
(775) 962-1333



February 27, 2024

U.S. Fish and Wildlife Service  
Pacific Southwest Region  
Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825

**Via Email:** [PermitsR8MB@fws.gov](mailto:PermitsR8MB@fws.gov)

***RE: N-4 State Grazing Board Comments to the US Fish and Wildlife Service's (Service) Draft Environmental Assessment (DEA) Regarding Depredation Permits for Common Raven Removal in Nevada***

Pacific Southwest Region Migratory Bird Program,

The N-4 State Grazing Board (Board) is a political sub-division of the State of Nevada organized under Nevada Revised Statute 568 Grazing and Range. This Board represents the ranchers who operate on public land grazing allotments within the Ely BLM District which includes White Pine, Lincoln and portion of Nye County, Nevada. Generally, the Board supports any comments provided by Lincoln, Nye, and White Pine Counties on this matter.

Increased raven take is very much needed within the N-4 State Grazing Board's area of interest. Board members and ranchers have reported increased raven populations and livestock loss in recent years, particularly related to lambing operations. This concern was expressed directly to Nevada Wildlife Services during the Board's Annual Meeting in June 2023. At that time, Nevada Wildlife Services reported that limited take permits issued by the Service as being their number one issue to addressing these concerns. While funding and capacity is always a concern, Mr. Ono seemed confident that he could implement additional take if permits were issued.

The Board is also concerned about the nexus between increasing raven populations, decreasing Sage-grouse populations and the impact on public land ranchers. Much of the N-4 area contains Sage-grouse habitat and much of that habitat has been decimated in recent years by prolonged drought and sever wild horse overpopulations. The result is poor habitat conditions for Greater Sage-grouse and increased depredation by ravens. Combined impacts have resulted in significant declines in Sage-grouse populations resulting in closure of hunting seasons and increased land use restrictions (including restrictions on grazing), which negatively impact this Board's members.



As it relates to the Alternatives presented by the Service in this DEA:

- The Board does NOT support the Service's "No Action Alternative" as take of 5,000 ravens per year has not been adequate.
- The Board does NOT support the "Proposed Action" / "Reduced Take Alternative" (11,000 ravens per year) as it simply does not provide enough control for a major problem in N-4 area of interest.
  - The Board also questions if a 1,000 Raven take for: human health & safety, agriculture, and livestock protection adequate. This level of take may not be adequate for the N-4 area of interest, let alone the entire State of Nevada.
- Of the alternatives presented, the Board would support implementation of Alternative 2, or the Issuance of Permits for up to the Potential Lethal Take Maximum.
  - However, the "Maximum Take" of 19,042 ravens per year is extremely conservative in that it is based on the 2013 population estimate (190,000 ravens) rather than the 2023 estimate (370,000 ravens). The maximum take in this alternative should be increased to 40,000 ravens per year, or the Service should evaluate another alternative specific to maximizing Sage-grouse protection.
- None of these alternatives should be based on current funding and capacity to carry out raven removal. Rather, alternatives that match the magnitude of the issue should be presented.

Thank you for the opportunity to provide input on this DEA. The Board appreciates your consideration of the above comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gracian Uhalde".

Gracian Uhalde, Chairman  
N-4 State Grazing Board

CC: Lincoln, Nye and White Pine Counties  
Mr. Mark Ono, State Director, Nevada Wildlife Services  
JJ Goicoechea, DVM, Director, Nevada Department of Agriculture



# Nevada Association of Counties

304 S. Minnesota Street

Carson City, NV 89703

775-883-7863

[www.nvnaco.org](http://www.nvnaco.org)

**February 23, 2024**

U.S. Fish and Wildlife Service  
Pacific Southwest Region  
Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825

VIA EMAIL TO: [Permitsr8mb@fws.gov](mailto:Permitsr8mb@fws.gov)

## **RE: Draft Environmental Assessment, Depredation Permits for Common Raven Removal in Nevada**

To Whom It May Concern:

The Nevada Association of Counties (NACO) is grateful for the opportunity to contribute feedback on the Draft Environmental Assessment (EA) by the U.S. Fish and Wildlife Service (FWS) concerning Raven Depredation permits in Nevada. NACO represents all 17 counties in Nevada and supports the counties by fostering intergovernmental cooperation, providing training, supporting good governance, and offering specialized field expertise. Given that Nevada's counties are predominantly rural and are encompassed by a large amount of federal and public lands, with economies heavily reliant on agriculture and natural resources, the sustainable management of wildlife holds paramount importance. It directly impacts county budgets, service delivery, rural communities, and overall ways of life. Nevada counties are particularly concerned at this time, with the potential listings of the Greater Sage Grouse, and the Bi-State Sage Grouse Distinct Population Segment (DPS). An Endangered Species Act (ESA) listing of either of these birds would have very significant negative impacts for our member counties. With this perspective in mind, we offer the following input on raven take permitting and the associated NEPA process.

While FWS acknowledges the “significantly increasing trend” in raven populations over recent decades and the exceptionally high, “five-fold increase in the number of ravens in Nevada”, between 1966 and 2013 as well as ravens’ role as the “most significant limiting factor to the recovery of sensitive species in Nevada” in the Draft EA, it does not then prescribe the appropriate level of take permits to meaningfully combat this population increase and the threats it poses. We are puzzled by USFWS reluctance to authorize the appropriate level of take to offset the exponential growth in raven populations in Nevada – growth which has been subsidized by human development and will be further subsidized given the current development and industrialization trends in the state. *“Historically, the sagebrush–steppe ecosystem likely had relatively low common raven population densities (Leu et al. 2008); but currently, this ecosystem supports higher numbers of common ravens because of increased vertical perching and nesting substrates (e.g., electrical power line towers and other structures), as well as human-related food sources (e.g., roadkill and refuse).<sup>1</sup>*

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<sup>1</sup> Boarman 1993; Sauer et al. 2004.

We are also concerned with the use of 2013 population data as a baseline for take permit decision making when, as FWS acknowledges, more recent data is available and reflects the continuing growth trend. *“The population of ravens in the United States is currently estimated at 2.5 million individuals, with 370,000 estimated in NV (Partners in Flight 2023).”*<sup>2</sup> The Draft EA should not base a maximum take level on the outdated 2013 data. The FWS should base its maximum take on current 2023 population estimates and the maximum take for raven permits should reflect what is needed for reducing raven population to sustainable levels, instead of maintaining the current situation of overpopulation and exponential growth. **We request that FWS add an alternative to this environmental assessment that is based on the threshold to minimize raven’s impact to sensitive and threatened species – a Sage Grouse Benefit Alternative.** This is the only means of fulfilling the purpose and need for this NEPA effort and of FWS meeting its wildlife management obligations. Continuing to allow raven overpopulation to deplete sensitive and threatened species, not to mention the State’s declining agricultural production, is unacceptable.

The Sage Grouse Benefit Alternative will require reducing the raven’s overpopulation, will inevitably have an environmental impact (albeit a net positive one), and will thus require a full Environmental Impact Statement (EIS). A reduction in raven population density back to approximately 0.40 ravens per square kilometer is what is required, according to the best available and most recent science, for sustainable sage grouse nest success, and for the conservation of the sensitive species.<sup>3</sup> Significant portions of priority habitat and breeding areas for sage grouse in Nevada are affected by raven population densities in excess of the 0.40 ravens per square mile density which has been established as the nest survival threat threshold in the recent USGS research.<sup>4</sup> It is estimated that in order to return these priority areas to raven population densities that will not continue to negatively impact greater sage grouse (and other sensitive or threatened species), there would need to be take permits greater than the Lethal Take Maximum established in this Draft EA. We strongly encourage an EIS of a raven take and depredation scenario that meets species conservation needs and intervenes in the anthropogenic disturbance → raven overpopulation → sage grouse depredation chain of events. The USGS research and mapping tools establish a means by which the Nevada Department of Wildlife (NDOW) and Nevada Wildlife Services (WS-NV) could effectively apply avicides and direct other lethal take measures to reduce impacts to sensitive species in a targeted manner. This cannot be done, however, at the inadequate take levels considered in this EA. A decision to implement Alternative 1 would fail to adequately meet the Purpose and Need for this NEPA effort, and arguably, even Alternative 2 for the “Lethal Take Maximum” fails in this regard. Under any of the alternatives currently considered in the Draft EA raven populations would either continue to grow, or in the very best-case scenario, stabilize at already excessively elevated densities. **The reality is that even at fulfillment of the Lethal Take Maximum (19,042 ravens eliminated from the Nevada range), raven populations will not stabilize at population densities that are sustainable for the sensitive and threatened species on which they frequently prey.**

NACO also contests the assertion in the Draft EA that the Nevada Department of Wildlife (NDOW) or Nevada Wildlife Services (WS-NV) have only requested take up to 11,000 ravens per year. Both state wildlife management entities are very much aware of the exponential growth rate in raven populations across the Great Basin, and of the science indicating the ravens’ resulting impacts to sage grouse nest survival rates. This science has been presented to the Sagebrush Ecosystem Council (SEC), the State’s sage grouse conservation decision making body. We request that FWS follow up and coordinate with NDOW,

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<sup>2</sup> Draft EA, p. 3

<sup>3</sup> Coates, P.S., et. al. 2020. Broad-scale impacts of an invasive native predator on a sensitive native prey species within the shifting avian community of the North American Great Basin. *Biological Conservation*, 243, <https://doi.org/10.1016/j.biocon.2020.108409>

<sup>4</sup> Ibid



WS-NV, and the SEC to better understand these entities' analysis of appropriate levels for raven take permits and then correct the Draft EA accordingly.

Lastly, the EA is inconsistent with the Nevada State Legislature resolution on raven control. In 2015, the Assembly Committee on Natural Resources, Agriculture, and Mining of the Nevada State Legislature passed Assembly Joint Resolution Number 2 (AJR 2) "*Urging the United States Congress and the United States Fish and Wildlife Service to take certain actions to reduce the impact of common ravens on the greater sage grouse and desert tortoise populations in this State.*"<sup>5</sup> The resolution states the will of Nevada's elected governing body that the overpopulation of ravens be controlled to protect sage grouse, desert tortoise, and other sensitive species from raven predation. **The FWS should seek consistency with the Nevada Legislature's resolution by issuing raven take permits sufficient to protect sensitive species, livestock, agricultural resources, and property from undue raven depredation.**

NACO appreciates the opportunity to provide input on this Draft EA process and we encourage the careful consideration of our comments by the FWS. We are also appreciative of FWS acknowledgment of the need to increase the lethal take permits for ravens. However, the baseline population data used, the current range of alternatives, and FWS's preferred alternative are all grossly inadequate for meaningfully addressing the true problem. We urge FWS to please address these inadequacies before issuing a Final EA or any Record of Decision.

Respectfully,



Vinson W. Guthreau  
Executive Director

VG/jb

CC:  
**Office of Governor Joe Lombardo**  
**Nevada Department of Conservation and Natural Resources**  
**Nevada Department of Wildlife**  
**USDA – Nevada Division of Wildlife Services**

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<sup>5</sup> [https://www.leg.state.nv.us/Session/78th2015/Bills/AJR/AJR2\\_EN.pdf](https://www.leg.state.nv.us/Session/78th2015/Bills/AJR/AJR2_EN.pdf)





JOE LOMBARDO  
Governor

STATE OF NEVADA  
**DEPARTMENT OF WILDLIFE**

6980 Sierra Center Parkway, Suite 120  
Reno, Nevada 89511  
Phone (775) 688-1500 • Fax (775) 688-1595

ALAN JENNE  
Director

JORDAN GOSHERT  
Deputy Director

CALEB MCADOO  
Deputy Director

MIKE SCOTT  
Deputy Director

February 23, 2024

U.S. Fish and Wildlife Service  
Pacific Southwest Region  
Migratory Bird Program  
Attention: Mr. Dan Blake  
2800 Cottage Way  
Sacramento, CA 95825

Dear Mr. Blake:

We would like to take this opportunity to thank you for producing the “Draft Environmental Assessment: Depredation Permits for Common Raven Removal in Nevada” (Raven EA) and providing an updated alternative for Common Raven (raven) take. Wildlife Staff Specialists and I reviewed the document and comments specific to the text are provided in the attached table.

Overall, we would like to express our concern with the ever-increasing population of ravens in the Great Basin and the impacts that we know they are having on species of special concern (e.g., Greater sage-grouse, Coates et al., 2020), listed species (e.g., Desert tortoise, Berry et al., 2020) and the likely effects that they are having on countless other species (e.g., herpetofauna and avifauna) that are less understood and possibly underrepresented. Since 2013, ravens have experienced a 94% population increase and now hover around 370,000 in Nevada. During that same approximate time frame, Greater sage-grouse populations have declined by 5.1% annually due to various factors (Coates et al. 2021). Given this untenable situation, we feel it is incumbent upon the U.S. Fish and Wildlife Service (Service) to reconsider its preferred alternative and we advocate for Alternative 2: Issue Permits for up to the Potential Lethal Take Maximum. We also advocate for the Service to consider updating the Potential Take Limit (PTL) based on more contemporary raven population estimates and associated literature (e.g., Harju et al., 2021; Sauer et al., 2017).

We hope the format for our comments and suggestions provided in the attached table is acceptable. Please take the time to review them and provide us with any clarifying questions as needed. If you have any general questions for us, do not hesitate to reach out. Again, thank you for the opportunity to provide our feedback.

Best Regards,

*Shawn Espinosa*

Shawn Espinosa, Game Division Administrator

cc: Thomas Leeman – USFWS, Migratory Bird Program  
Emily Hockman – USFWS, Migratory Bird Program  
Mike Scott – Deputy Director, NDOW

## References:

- Berry, K.H, J.L. Yee, T.A. Shields, and L. Stockton. 2020. The catastrophic decline of tortoises at a fenced natural area. *Wildlife Monographs* 205: 1-53.
- Coates, P.S., S.T. O'Neil, B.E. Brussee, M.A. Ricca, P.J. Jackson, J.B. Dinkins, K.B. Howe, A.M. Moser, L.J. Foster, and D.J. Delehanty. 2020. Broad-scale impacts of an invasive native predator on a sensitive native prey species within the shifting avian community of the North American Great Basin. *Biological Conservation* 243:108409.
- Harju, S., P.S. Coates, S.J. Dettenmaier, J.B. Dinkins, P.J. Jackson, and M.P. Chenaille. 2021. Estimating trends of common raven populations in North America, 1966-2018. *Human Wildlife Interactions* 15:248-269.
- Sauer, J.R., Niven, D.K., Hines, J.E., Ziolkowski, D.J., Jr., Pardieck, K.L., Fallon, J.E., & Link, W.A. (2017). The North American breeding bird survey, results and analysis 1966-2015. Laurel, MD: USGS Patuxent Wildlife Research Center.

Table 1. Nevada Department of Wildlife comments pertaining to the Draft Environmental Assessment: Depredation Permits for Common Raven Removal in Nevada. Review provided and collected by Game Division Staff.

Page #	Section	Paragraph #	Sentence	Comment
1	1	1		The purpose of the EA should be clearly stated. The purpose should be to bring common raven population numbers in Nevada to a level that is more in line with natural ecosystems and carrying capacities rather than those artificially elevated by anthropogenic subsidies. It should be made clear that this goal, or objective, is not in conflict with the Migratory Bird Treaty Act in that, even with fairly significant reductions in the common raven population in the Great Basin, that would not “threaten” raven populations at regional or range-wide scales.
1	2	1	1	While this statement may be true in some respects, it does not adequately portray the current situation as the common raven population has expanded in both distribution and numbers to the point that more natural predator prey relationship are no longer in balance. Furthermore, this predator - prey imbalance could be allowing common ravens to have a more significant “top down” effect on sensitive prey species (e.g., Greater sage-grouse and desert tortoise) than if in natural ecological balance.
2	2	3	1 & 2	Much of this paragraph seems to be mostly repetitive information and therefore may not be necessary.
3	3	2	2	The 2020 WS-EA reference is confusing. It is also not included in the bibliography.
3	3	2	2	We could not find “Partners in Flight 2013” in the literature cited section.
3	3	2	2 & 3	These values indicate a 94% increase in the population of common raven over the last decade. During that same approximate time frame, sage-grouse population have declined at a rate 5.1% per year (Coates et al. 2021) and important vital rates (e.g., nest success) has been proven to be negatively affected once common raven densities reach certain thresholds (0.4 raven/square kilometer).
3	3	2	4	Rapidly growing common raven populations is a known issue; the USFWS gives no rationale why they agree that Nevada’s population is 370,000 individuals, yet an older estimate is used to estimate maximum take.
4	3	3	3	In this paragraph, some mention should be made with respect to how difficult some of these methods may be to employ across large landscapes, whether they be the sagebrush ecosystem for Greater sage-grouse or the Mojave desert for desert tortoise.
4	3	4	3	This sentence is misleading. Consider “The treated eggs are eaten by ravens, which leads to renal failure and death in 24-72 hours (Cunningham et al. 1979, Coates et al. 2007)

5	4	1	2	<p>NDOW <b>does not</b> agree that a lethal take of 10,000 ravens per year will be adequate to provide protection to sensitive species. Especially given the current status of raven populations. However, NDOW does feel that the lethal take of up 10,000 ravens would allow increase protection over the current 2,500 lethal take, both temporally and spatially, for sensitive prey species, while possibly dampening the intrinsic growth rate (<i>r</i>) of ravens at local or site scales.</p> <p>On November 20, 2023, NDOW emailed a copy of a renewal request for permit #mb37116a-0, this request was for 10,000 ravens for 2024. This did not include a take request from USDA WS or other permittees.</p>
6	5	1	3	<p>We question why the Service would use the 2013 estimate of raven abundance from Partners in Flight (also not in the literature cited section) instead of the more recent data from Partners in Flight from 2023 where the raven population estimate was updated to 370,000 individuals in Nevada. The PIF 2023 reference is also not in the literature cited section.</p>
6	5.2.1.1	1	4	<p>This sentence states that “In accordance with the MBTA, the objective in this case would be no net loss to raven populations.” We could find no language within the MBTA where “no net loss” was a goal or an objective for managing predatory species such as common ravens.</p>
7	5.2.1.1	2	1	<p>We would argue that the removal of 11,000 ravens (which equates to a take rate of 2.99%) would have a “significant effect” on common raven population growth. Also, we could not find a reference in the literature cited section for “Partners in Flight 2020”. In fact, this statement seems contradictory to the statement in the paragraph above that indicates that ravens may sustain an annual take of approximately 12.5% of the population and will continue to remain stable (i.e., allowing 2.99% lethal take to be completely compensatory mortality).</p>
7	5.2.1.1	3	1 & 2	<p>Again, NDOW <b>does not</b> feel that the take of 11,000 ravens per year will ensure adequate protection for sensitive species given that raven population have increased by 94% in the last decade to an estimated 370,000 individuals. Conversely, NDOW feels that with the continual expansion and infill of raven populations and exponential growth in the Great Basin, mortality to sensitive prey species (e.g., Greater sage-grouse and desert tortoise) could become totally additive across all resource scales (first, second, third and fourth orders).</p>
7	5.2.1.1	3	3	<p>The sentence states that the “Increasing raven populations, along with an increased presence of human activity, can be expected to lead to a greater need for resource protection”. That time is now. Currently, there is a greater need for resource protection due to increased raven populations.</p>
7	5.2.6	2	1	<p>Would this sentence be more appropriate in section 5.3 since it is supporting the Potential Lethal Take Maximum?</p>



10	5.3.1.1	2	2	The sentence states that a take rate of 5.18% (19,042) would have a significant effect on population growth. This is in contradiction with the statement on page 7, section 5.2.1.1 that states that ravens may sustain an annual take of approximately 12.5% and continue to remain stable. Therefore, we do not agree that a take of 5.18% would have a significant effect on the population growth rate of common ravens.
12	5.5	3	1	Common ravens in Nevada <b>are</b> part of a larger metapopulation (O'Neil et al. 2018)
13	5.5			The Service arrives at the conclusion that the preferred alternative (reduced take) will not affect the long-term viability of common ravens and that, in contrast, the Service expects the population to grow given this alternative, which is not in alignment with conserving certain species of special concern and listed species.

Coates, P. S., J. O. Spencer Jr, and D. J. Delehanty. 2007. Efficacy of CPTH-treated egg baits for removing ravens. *Human-Wildlife Conflicts* 1:224–234.

Cunningham, D. J., E. W. Schafer, and L. K. McConnell. 1979. DRC-1339 and DRC-2698 resistance in starlings: preliminary evaluation of their secondary hazard potential. *Proceedings of the Bird Control Seminar* 8:31–37.

O'Neil, S. T., P. S. Coates, B. E. Brussee, P. J. Jackson, K. B. Howe, A. M. Moser, L. J. Foster, and D. J. Delehanty. 2018. Broad-scale occurrence of a subsidized avian predator: reducing impacts of ravens on sage-grouse and other sensitive prey. *Journal of Applied Ecology*.



# Nevada Farm Bureau Federation

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February 24, 2024

U.S. Fish and Wildlife Service Pacific Southwest Region

Migratory Bird Program

2800 Cottage Way

Sacramento, CA 95825

(sent by email to: [PermitsR8MB@fws.gov](mailto:PermitsR8MB@fws.gov))

Re: Draft Environmental Assessment (EA) For Decisions On Common Raven Permits For Take In The State Of Nevada

Dear Sirs:

We wish to have these comments considered in the process of determining Raven Permits For Take in the state of Nevada. The Nevada Farm Bureau Federation is a general farm organization, representing farmer and rancher members throughout the state of Nevada. Our organization has also been deeply involved in conservation efforts to protect Greater Sage Grouse as well as Bi-State Sage Grouse.

Based on review of the Draft Environmental Assessment (EA), the Nevada Farm Bureau Federation strongly supports the ***“Alternative 2: Issue Permits for up to the Potential Lethal Take Maximum.”***

Frankly, we are uncertain why the “Preferred Alternative” was selected to be the option that the U.S. Fish and Wildlife Service chose? We were of the belief that protection of Sage Grouse was a priority and by the Service’s documentation in the Draft EA, the Potential Lethal Take Maximum (Nevada Farm Bureau’s preference) would provide a greater degree of protection for Sage Grouse “without causing a decline in the Nevada population” of Ravens.

The Service has documented that the alternative for the issuance of maximum potential lethal take would allow for 19,042 ravens across the state of Nevada would be carried out in a humane method, using DRC 1339, without any unacceptable risk to Non-Target Migratory Birds or other environmental harm. Again, quoting from the Draft EA, ***“The results estimate that up to 19,042 ravens can be removed annually in Nevada while still maintaining a stable population.”***

Further the Draft EA notes, ***“Since it would take considerable effort, likely beyond the current available resources, to remove more than 19,000 ravens per year, it is unlikely that the actual number of ravens taken would be close to the potential lethal take maximum...”***

If the lethal take maximum would have no impact on the stable population of Ravens and would have greater benefits for the ***“increase of Greater Sage-Grouse recruitment and nest success...”*** - -- why wouldn’t the selection be made of the alternative to “Authorize up to the Potential Lethal Take Maximum?”

Based on the information presented in the Draft EA, the Nevada Farm Bureau Federation strongly urges that approval be given to “Authorize up to the Potential Lethal Take Maximum” of 19,042 Ravens.

Sincerely,

A handwritten signature in cursive script, reading "Bevan Lister". The signature is written in black ink and is positioned below the word "Sincerely,".

Bevan Lister, President  
Nevada Farm Bureau Federation

JOE LOMBARDO  
Governor

STATE OF NEVADA

J.J. GOICOECHEA, DVM  
Director



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## DEPARTMENT OF AGRICULTURE

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February 28, 2024

U.S. Fish and Wildlife Service  
Pacific Southwest Region Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825

Submitted via: [PermitsR8MB@fws.gov](mailto:PermitsR8MB@fws.gov)

RE: [Draft Environmental Assessment: Depredation Permits for Common Raven Removal in Nevada, January 24, 2024](#)  
(U.S. Fish and Wildlife Service).

To Whom it May Concern:

The Nevada Department of Agriculture (NDA) has a mission to preserve, protect and promote agriculture in the state of Nevada. This letter is to provide comments on the Draft Environmental Assessment (DEA) titled *Depredation Permits for Common Raven Removal in Nevada*, prepared by the U.S. Fish and Wildlife Service (USFWS).

The EA in Section 3. **Background** shows an estimated population of 370,000 ravens in Nevada. This is a significant increase over the 2013 estimate of 190,000 ravens. With trends in sensitive wildlife species populations moving downward and the increased requests for agriculture assistance, now is the time to address the raven overpopulation in Nevada. The NDA takes exception to the statement that NDOW and WS-Nevada requested 10,000 ravens per year. Our close coordination with both agencies provides us with knowledge of permit requests totaling more than 10,000 ravens.

The modelled maximum potential lethal take is based on the 2013 population estimate. The NDA requests the modelling be done on the 2023 estimates, to reflect current conditions more accurately in Nevada. In addition to the need for accurate, up to date modeling, the agency requests USFWS create an adaptive management alternative. This alternative would allow for real-time adjustments to be made based on populations and impacts, and not dependent on an often-delayed NEPA analysis.

JOE LOMBARDO  
Governor

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The DEA conflicts with itself and other publications in several areas. For example, in section 5.2.1.1 **Adult Take**, the document reads “...*we can conclude that 19,042 ravens could be removed from the state of Nevada and the population would remain stable.*” In the very next sentence, the document cites Partners in Flight 2020 and reads, “...*removing 11,000 ravens equates to 2.99%, and thus would have a significant effect on population growth.*” What is the “significant” effect referenced here? If taking 8,000 additional ravens annually results in a stable population, the NDA is confused by the statement that a lower take would result in an effect on population growth. The NDA requests clarification on the maximum number of ravens able to be taken annually from Nevada, while allowing for stable populations

In a previous section, the DEA states renal failure typically occurs within 12 hours or less when using DRC-1339 application methods. This statement is inaccurate. If this were the case, the effectiveness of DCR-1339 would be greatly reduced due to the raven population associating the consumption of bait with mortality. The peer reviewed final document titled “The Use of DRC-1339 in Wildlife Damage Management” states in section 2.4.2 Mode of Action, “*In sensitive birds, DRC-1339 causes irreversible kidney and heart damage resulting in death normally within 1 to 3 days of ingestion.*” The NDA respectfully seeks a correction in the language to reflect the previous studies results of timing of death.

Section 5.2.2 **Effects on other species** in the DEA states, “The majority of raven take is related to the protection of Greater Sage-Grouse, according to WS-Nevada.” This statement would depend on the year. There are years when raven take for agriculture is higher than wildlife protection, especially if funding of projects for wildlife are limited during some years. The NDA requests that the language be corrected to reflect that take is dependent on impacts seen during a year. In addition, the impact that the raven population has on the Desert Tortoise cannot be ignored when discussing effects on other species.

The NDA fully appreciates the impact an increasing raven population has on conservation efforts for the Greater Sage-Grouse and the agency is asking the USFWS to take a more aggressive role in lessening the impact that ravens have on nest success. Recent science supports the need to lower the raven population, for example, “*An increase of 1 raven per square km reduces nest survival by 57.2%*”, as published by Dr. Peter Coates, et al in Biological Conservation Volume 243, March 2020. The inclusion of this science in the analysis is paramount in establishing a meaningful alternative.

In closing, the NDA does not support the Preferred Alternative of a Reduced Take and the agency does not support the No Action Alternative. Ideally, the USFWS would evaluate and adopt an Adaptive Management Alternative using current population numbers and science. Should the adoption of the Adaptive Management Alternative not be pursued, the NDA would support Alternative 2: Issue Permits for up to the Potential Lethal Take Maximum, but again the agency requests the alternative be based on current population estimates and not estimates over a decade old.

Thank you for the opportunity to comment on this DEA and the NDA looks forward to working with the USFWS to develop an effective program to deal with an increasing population of Common Ravens in Nevada.

Sincerely,

J.J. Goicoechea, DVM  
Director

**Sagebrush Ecosystem Council**

**Chris MacKenzie**, Wildlife, Chair  
**Jake Tibbitts**, Local Government, Vice-Chair  
**Steve Boies**, Ranching  
**Kyle Davis**, Mining/Minerals  
**Bevan Lister**, Agriculture  
**William Molini**, Conservation & Environment  
**Sherman Swanson**, General Public  
**Daphne Emm Hooper**, Tribal Nations  
**Mathew Johns**, Energy



**Sagebrush Ecosystem Technical Team**

**Kathleen Steele**, Program Manager  
**Cheyenne Acevedo**, Wildlife  
**Justin Lambert**, Forestry/Wildland Fire  
**Sarah Hale**, State Lands  
**Skyler Monaghan**, Agriculture

**Joe Lombardo, Governor**

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February 26, 2024

Paul Souza  
U.S. Fish and Wildlife Service  
Pacific Southwest Region  
Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825  
[PermitsR8MB@fws.gov](mailto:PermitsR8MB@fws.gov)

Dear Mr. Souza,

The Nevada Sagebrush Ecosystem Council (Council) is a statutorily established body that collaborates with landowners, tribal nations, non-governmental organizations, local, state, and federal agencies in order to address and mitigate the threats related to the sagebrush ecosystem and to the Greater Sage-Grouse (sage-grouse). We are particularly concerned about increased threats due to the steady population increase of Common Ravens (ravens) in Nevada. The increase in the raven population has led to severe depredation of sensitive species, such as Greater sage-grouse (*Centrocercus urophasianus*). This escalation in predation poses a significant threat to the conservation efforts of this vulnerable species.

**The Nevada Sagebrush Ecosystem Council supports Alternative 2, Authorizing up to the Potential Lethal Take Maximum in the 2024 Environmental Impact Statement for Depredation Permits for Common Raven Removal.** It is essential that decisive action is taken to mitigate the detrimental effects of raven predation on native wildlife populations.

Additionally, we strongly recommend the implementation of a **Conservation Order** or something similar against Common Ravens in Nevada in order to reduce the population. By reducing the population size of raven to a manageable level, we can begin to address the negative impact they have on sensitive wildlife species and restore the ecological balance in the region. This measure is crucial in ensuring the long-term sustainability of the affected ecosystems and safeguarding the survival of imperiled wildlife species.

We urge the U.S. Fish and Wildlife Service to prioritize the protection of these at-risk wildlife and consider the urgent need for effective management of Common Ravens in Nevada. Your commitment to conservation and biodiversity preservation is vital in addressing the escalating threat of raven predation on sensitive wildlife species.

Thank you for considering our concerns and taking proactive steps towards mitigating the destructive impacts of Common Ravens in Nevada. Your dedication to wildlife conservation is deeply appreciated, and we look forward to seeing positive and sustainable outcomes for the affected ecosystems.

Sincerely,

A handwritten signature in blue ink, appearing to read 'C MacKenzie', with a long horizontal stroke extending to the right.

Chris MacKenzie  
Chairman  
Sagebrush Ecosystem Council



Laurie L. Carson, Chairman  
Janet VanCamp, Vice Chairman  
Commissioner Richard Howe  
Commissioner Shane Bybee  
Commissioner Hank Vogler

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Nichole Stephey, Ex-officio Clerk of the Board

**White Pine County**  
**Board of County Commissioners**

WPClerk@WhitePineCountyNV.Gov

February 28, 2024

U.S. Fish and Wildlife Service  
Pacific Southwest Region  
Migratory Bird Program  
2800 Cottage Way  
Sacramento, CA 95825

**Via Email:** [PermitsR8MB@fws.gov](mailto:PermitsR8MB@fws.gov)

**RE: White Pine County, Nevada Comments Regarding the US Fish and Wildlife Service's (Service) Draft Environmental Assessment (DEA) Regarding Depredation Permits for Common Raven Removal in Nevada**

Dear Pacific Southwest Region, Migratory Bird Program:

White Pine County (County) appreciates the Service's publication of this document and proactive approach to a possible increase in take of Common raven in Nevada. Increased raven take is very much needed in this and surrounding Counties. Much of the County contains Sage-grouse habitat and much of that habitat has been decimated in recent years by prolonged drought and severe wild horse overpopulations. The result is poor habitat conditions for Greater Sage-grouse and increased depredation by ravens. Combined impacts have resulted in significant declines in Sage-grouse populations resulting in closure of hunting seasons and increased land use restrictions, which negatively impact the County. In addition, many of the County's customs and culture are based on agriculture and ranching. Both farmers and ranchers have reported increased raven populations and depredation issues and livestock loss in recent years.

The County was surprised to find that the DEA did not cite any of the recent publications by Dr. Pete Coates with the US Geological Survey (USGS). Dr. Coates has made several public presentations to State Boards and Commissions that make it clear the impact ravens are having on Sage-grouse populations. His findings suggest that even in quality habitat, raven densities over a given threshold can have negative impacts on Sage-grouse populations. The County would recommend that the Service review and incorporate these findings into its Final EA (see attached for references).

The County does NOT support the Service's No Action Alternative as take of 5,000 ravens per year has not been adequate. The County does NOT support the Proposed Action, or "Reduced Take Alternative" as it simply does not provide enough control for a major problem in this County. Of the alternatives presented, the County would support implementation of Alternative 2, or the Issuance of Permits for up to the Potential Lethal Take Maximum. However, the "Maximum Take" of 19,042 ravens per year is extremely conservative in that it is based on the 2013 population estimate (190,000 ravens) rather than the 2023 estimate (370,000 ravens). Either the maximum take in this alternative should be increased to 40,000 ravens per year, or the Service should evaluate another alternative specific to



maximizing Sage-grouse protection. A "Sage-grouse Protection" alternative should be developed with the Nevada Department of Wildlife (NDOW) and Nevada Wildlife Service (NWS) to determine the number of ravens that would need to be taken to get population densities in key Sage-grouse areas below the critical density threshold within the next five (5) years. None of these alternatives should be based on current funding and capacity to carry out raven removal. Both NDOW and NWS have indicated in public meetings that the limiting factor to raven removal is the limited take allowed by the Service, and that funding and capacity could be ramped up if the take permit were increased. This issue needs to be resolved as soon as possible.

White Pine County appreciates the opportunity to provide these comments and looks forward to a Final EA and subsequent increased action as related to ravens in White Pine County. For additional information or questions on this comment letter, please contact the County's Natural Resources Consultant, Jeremy Drew at [jeremy@rci-nv.com](mailto:jeremy@rci-nv.com) or by phone at (775) 883-1600.

Respectfully,



Laurie L. Carson, Chair

White Pine County Board of County Commissioners

Attachment: Excerpts from *Annotated Bibliography of Scientific Research on Greater Sage-Grouse Published from October 2019 to July 2022*

cc: Nevada Wildlife Services  
Nevada Department of Wildlife  
Nevada Department of Agriculture  
Nevada Sagebrush Ecosystem Council  
White Pine County Natural Resources Advisory Committee

# **Annotated Bibliography of Scientific Research on Greater Sage-Grouse Published from October 2019 to July 2022**



Open-File Report 2023–1082  
Version 1.1, November 2023

**Implications:** The authors state that these data represent habitat use of translocated GRSG across life stages and could be used to inform habitat management and future release locations within the study area.

**Topics:** behavior or demographics; translocation; broad-scale habitat characteristics; habitat selection; sensitive/rare wildlife; includes new geospatial data

**Coates, P.S., O'Neil, S.T., Brussee, B.E., Ricca, M.A., Espinosa, S.P., Gardner, S.C., and Delehanty, D.J., 2020, Spatially-explicit predictive maps of greater sage-grouse nest selection integrated with nest survival in Nevada and northeastern California, USA: U.S. Geological Survey data release.**

**DOI:** <https://doi.org/10.5066/P9TE06L4>

**Background:** Frequent landscape change from wildfires in the American West has reduced habitat for specialist species. Habitat reduction may cause habitat specialists, such as the GRSG, to select suboptimal habitat, which can threaten species persistence. This data release supported research by O'Neil and others (2020; <https://doi.org/10.1111/gcb.15300>).

**Objectives:** The authors sought to (1) research the consequences of GRSG habitat selection and (2) investigate if habitat quality in GRSG nesting areas affects population growth.

**Methods:** The authors focused on sagebrush ecosystems affected by wildfire and used a spatiotemporal dataset of GRSG nest locations and outcomes in conjunction with spatially explicit models to identify effects to and quantify drivers of nest site selection and survival.

**Location:** northeastern California, Nevada; CC-E; MZ III, MZ IV, MZ V

**Findings:** The authors produced a map classifying GRSG nesting habitat from high survival and high selection (adaptive) to low survival and high selection (maladaptive).

**Implications:** The authors suggest that identifying patterns of spatial variability, particularly in areas disturbed by wildfire and invasive annual grasses, could help managers identify suboptimal habitat that may be selected by GRSG and prioritize those areas for conservation and management action.

**Topics:** survival; behavior or demographics; broad-scale habitat characteristics; site-scale habitat characteristics; habitat selection; effect distances or spatial scale; fire; nonnative invasive plants; water; infrastructure; sensitive/rare wildlife; includes new geospatial data

**Coates, P.S., O'Neil, S.T., Brussee, B.E., Ricca, M.A., Jackson, P.J., Dinkins, J.B., Howe, K.B., Moser, A.M., Foster, L.J., and Delehanty, D.J., 2020, Broad-scale impacts of an invasive native predator on a sensitive native prey species within the shifting avian community of the North American Great Basin: Biological Conservation, v. 243, article 108409, 10 p.**

**DOI:** <https://www.doi.org/10.1016/j.biocon.2020.108409>

**Background:** Common ravens are a generalist predator, and their increasing populations overlap with GRSG habitat, threatening nest survival. Estimating raven densities and abundance is necessary to determine if they pose a significant threat to GRSG populations.



**Objectives:** The authors sought to (1) estimate raven abundance and density, (2) determine factors that drive predicted raven densities, (3) determine relations between GRSG nest survival and raven densities across time and at landscape scales, and (4) map predicted landscape-scale effects of ravens on GRSG populations.

**Methods:** Between 2007 and 2016, researchers conducted 16,974 point count surveys at 43 sites to estimate common raven densities. They evaluated the relation between raven densities and environmental factors to estimate raven abundance. From 2009 to 2016, they captured and marked GRSG to monitor nests and measured environmental factors to determine the effects on nest survival. Environmental variables included vegetation cover, elevation, topography, climate variables, and distance to anthropogenic structures. Finally, they created a map to predict where raven density would likely affect sage-grouse nest survival.

**Location:** northeastern California, southwestern Idaho, Nevada, and eastern Oregon; CC-A, CC-E, CC-F, CC-D; MZ II, MZ III, MZ IV, MZ V

**Findings:** The authors found that raven density was greatest at sites that were closer to developed areas, agricultural fields, transmission lines, and at lower elevations. They found that nest survival decreased with increasing raven density but increased with a later initiation date, higher moisture conditions, greater topographic roughness, and more shrub cover. They determined that most GRSG breeding areas have raven densities associated with lower-than-average nest survival.

**Implications:** The authors emphasize that human-related changes to the landscape may result in increased raven abundance and consequently decrease GRSG nest survival. They suggest that monitoring raven populations and determining areas that overlap with GRSG populations can inform management decisions to reduce predation.

**Topics:** survival; behavior or demographics; population estimates or targets; broad-scale habitat characteristics; habitat selection; effect distances or spatial scale; predators or predator control; infrastructure; agriculture; sensitive/rare wildlife

## **Coates, P.S., O'Neil, S.T., Brussee, B.E., Ricca, M.A., Jackson, P.J., Dinkins, J.B., Howe, K.B., Moser, A.M., Foster, L.J., and Delehanty, D.J., 2020, Data maps of predicted raven density and areas of potential impact to nesting sage-grouse within sagebrush ecosystems of the North American Great Basin: U.S. Geological Survey data release.**

**DOI:** <https://doi.org/10.5066/P9T5JT8N>

**Background:** Understanding the relation between the density of the common raven—a known GRSG nest predator—and GRSG populations is important for management decisions about ecosystem protection and restoration. This data release supported research by Coates and others (2020; <https://doi.org/10.1016/j.biocon.2020.108409>).

**Objectives:** The authors sought to create a dataset predicting where raven densities may be affecting GRSG populations.

**Methods:** The researchers used distance sampling models to estimate raven densities at 43 field sites. They incorporated 15 landscape-level factors to predict average raven densities including climate, vegetation, topography, and anthropogenic features. They mapped areas where estimated raven density exceeded GRSG thresholds of nest survival to predict potential population-level effects of ravens on GRSG.

**Location:** California, Idaho, Nevada, Oregon, Utah; CC-A, CC-D, CC-E, CC-F; MZ II, MZ III, MZ IV, MZ V, MZ VII

**Findings:** The authors created a dataset that predicted current common raven densities and mapped the areas where raven densities may be affecting GRSG nest survival.

**Implications:** The authors suggest that this dataset can inform management decisions for GRSG habitat protection and restoration.

**Topics:** population estimates or targets; broad-scale habitat characteristics; predators or predator control; sensitive/rare wildlife; includes new geospatial data