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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF ARIZONA

WILDEARTH GUARDIANS, Plaintiff, v. UNITED STATES FISH AND WILDLIFE SERVICE and UNITED STATES FOREST SERVICE, Defendants.	CASE NO. 4:13-cv-151-RCC **DEFENDANTS' REPLY IN SUPPORT OF THE MOTION TO DISSOLVE THE COURT'S INJUNCTION RE THE CIBOLA NATIONAL FOREST** **[EXPEDITED REVIEW REQUESTED]**

INTRODUCTION

The question before this Court on Defendants' motion to dissolve the Court's injunction on the Cibola National Forest is a narrow one: whether the U.S. Fish & Wildlife Service's ("FWS") completion of its reinitiated Section 7(a)(2) consultation under the Endangered Species Act ("ESA") and its issuance of a superseding biological opinion ("BiOp") warrants dissolution of the Court's September 12, 2019 injunction insofar as it applies to the Cibola National Forest ("Cibola"). *See* ECF No. 89 at 36-39.[1] As discussed in Defendants' opening motion, ECF No. 112, because Defendants have completed both actions ordered by the Court, its injunction enjoining all timber management actions on the Cibola should, by its terms, be dissolved.

Plaintiff, however, conflates this narrow question with a larger inquiry into the merits of FWS's 2019 superseding Cibola BiOp. *See* ECF No. 121. But this inquiry must be brought in a separate lawsuit based on a separate administrative record. And, not only is Plaintiff's attempt to assess the validity of FWS's 2019 superseding BiOp improper, but its core merits argument – that the agencies are required to use broad-scale population monitoring to avoid jeopardizing the Mexican spotted owl ("owl") by testing assumptions as to the impacts of local, site-specific protective treatments – is simply wrong. In support of that argument, Plaintiff takes advantage of a complex and nuanced management approach to confuse and distract; it blurs the lines among many different types of monitoring (all with different scales and purposes) and cherry-picks statements out of context to string together a false narrative regarding the U.S. Forest Service's ("USFS") alleged sinister efforts to undermine the conservation of the owl.

Plaintiff's merits arguments, while improper in this motion and in this lawsuit, could not be further from the truth. Even if broad-scale population data was available (it will not be until 2023 at the earliest), the scale of that data does not permit any meaningful analysis of whether the site-specific fuels reduction or forest restoration

[1] Citations to Court documents reference the page numbers generated by ECF.

projects implemented under the Cibola Forest Plan will appreciably reduce the owl's prospects for recovery. Rather, the information is needed for FWS to assess the effectiveness of its overall recovery efforts. In other words, it is used to track the effects of broad-scale threats (e.g., high-severity, landscape-altering wildfire, drought, and climate change) on current and future nest/roost habitat which then allows FWS to determine how, where, and what type of changes to the recovery plan management recommendations best help combat those broad-scale threats. Plaintiff's arguments, once stripped of hyperbole and misdirection, amount to nothing more than an ill-informed disagreement. But mere disagreement does not invalidate FWS's lawful and reasonable conclusions detailed in the 2019 Cibola BiOp (or 2012 BiOps, *see* ECF Nos. 104, 111).

For these reasons, the Court should dissolve the injunction on the Cibola (or, more appropriately, grant Defendants' pending motion to alter judgment, ECF Nos. 104, 111). Allowing the Cibola to continue its protective activities will protect the owl and its habitat from high-severity, landscape-altering wildfire – the primary threat to the owl's survival and recovery and the 2012 Recovery Plan's chief objective. It will also protect the surrounding communities from wildfire and avoid further unnecessary damage to local economies and further unnecessary job loss before the holiday season.

ARGUMENT

I. The Injunction On The Cibola Should Be Dissolved Because Defendants Have Completed Consultation And Issued A Superseding BiOp.

In its response, ECF No. 121 at 2, Plaintiff does not dispute that the applicable standard of review on Defendants' motion is whether there has been a "significant change either in factual conditions or in law" that warrants dissolution. *Rufo v. Inmates of Suffolk Cty. Jail*, 502 U.S. 367, 384 (1992). Any such "significant change" must specifically relate to the "underlying reasons for the injunction." *Moon v. GMAC Mortg. Corp.*, No. C08-969Z, 2008 WL 4741492, at *2 (W.D. Wash. Oct. 24, 2008).

In its order dated September 12, 2019, this Court enjoined USFS's timber management activities in the Cibola pending: (1) the completion of reinitiated Section

7(a)(2) consultation and (2) the issuance of a new superseding BiOp. ECF No. 89 at 36-39. Both events have now occurred, which constitute "significant changes" that directly address "the underlying reasons for the injunction." *Moon*, 2008 WL 4741492 at *2. Accordingly, Defendants have complied with the terms of the Court's order and the injunction should be dissolved.

II. Plaintiff Must Challenge FWS's 2019 Cibola BiOp In A Separate Lawsuit.

Plaintiff's plea for this Court to analyze the merits of FWS's 2019 superseding Cibola BiOp, ECF No. 121 at 5-8, is improper. The submission before the Court is offered only to demonstrate Defendants' compliance with the two actions ordered by this Court – (1) completing reinitiated consultation and (2) issuing a superseding BiOp. The 2019 Cibola BiOp itself is a separate and final agency action supported with its own administrative record. The action and decisions made in the 2019 Cibola BiOp stand on their own merit and are outside of the 2012 BiOps now before the Court. Analysis of the merits of a new agency requires a separate lawsuit. *Monsanto Co. v. Geertson Seed Farms*, 561 U.S. 139, 162 (2010); *All. for the Wild Rockies v. Savage*, 897 F.3d 1025, 1031-32 (9th Cir. 2018); *Am. Rivers v. NMFS*, 126 F.3d 1118, 1124 (9th Cir. 1997).

III. FWS's 2019 BiOp Appropriately Found That The Cibola Forest Plan Would Not Appreciably Reduce the Owl's Prospects For Recovery.

Even assuming the Court must undertake a merits-based review of the 2019 superseding Cibola BiOp before dissolving the injunction, which Defendants dispute, FWS's decision that the proposed action – the local, site-specific projects designed to reduce wildfire risk implemented under the Cibola Forest Plan – would not appreciably reduce the owl's prospect for recovery.

Here, Section 7(a)(2) is concerned with whether the local, site-specific projects designed to protect owl habitat consistent with the Cibola Forest Plan would cause harm that is likely to jeopardize the continued existence of a listed species. 16 U.S.C. § 1536(a)(2). In undertaking its jeopardy analysis, FWS must assess the Cibola Forest Plan's effect on the likelihood of survival and recovery of the owl. *See* 50 C.F.R. §

402.02 (an agency action "jeopardize[s] the continued existence" of a species if it "reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species"); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 932 (9th Cir. 2008) (interpreting this regulation to require a consideration of "effects on recovery as well as effects on survival"). The standard used for both survival and recovery within Section 7(a)(2) is the same – using the best available data, whether a proposed action appreciably reduces prospects for recovery. This applies to all federal actions including those not contributing to recovery.

In analyzing jeopardy – whether the local, site-specific projects implemented under the Cibola Forest Plan appreciably reduced the owl's prospect for survival *and* recovery – FWS used the best available data to date and noted the following:

1. Threat Of Nest/Roost Habitat Destruction

- The sole limiting factor on owl survival and recovery is the loss of current nest/roost habitat (old-growth, multi-layered canopy habitat) and future nest/roost habitat (recovery habitat). ECF No. 112-1 at 5, 6.
- High-severity, landscape-altering wildfire is the primary threat to current and future nest/roost habitat. *Id*. at 6, 22.
- High-severity, landscape-altering wildfires, such as the Rodeo-Chediski Fire (2002), the Wallow Fire (2011), and the Whitewater-Baldy Complex (2012) burned tens of thousands of acres of current and future nest/roost habitat across significant portions of the owl's range. *Id*. at 6.
- On the Cibola, since 2012, 25 wildfires burned thousands of acres of current and future nest/roost habitat – approximately 10,743 Protected Activity Center ("PAC") acres, 68,096 recovery habitat acres, and 58,293 acres of critical habitat. *Id*. at 13.
- The main recovery objective, as detailed in the Recovery Plan (both 1995 and 2012), is to protect current and future nest/roost habitat – primarily from high-

severity, landscape-scale wildfire. ECF No. 112-1 at 21.

2. Proposed Action: The Continued Implementation Of The Cibola Forest Plan

- The Cibola Forest Plan, through the 1996 standards and guidelines, adopted the Recovery Plan's primary recovery objective to protect and recruit nest/roost habitat. *Id*. at 6, 16-18, 21-22.
- Consistent with the recovery objective, the Cibola eliminated its commercial, even-aged timber harvest. *Id*. at 16.
- Consistent with the recovery objective, instead of commercial, even-aged timber harvest, the Cibola designs site-specific, uneven-aged timber management projects (e.g., thinning, prescribed burns, etc.) intended to reduce wildfire fuel to protect current and future nest/roost habitat from high-severity, landscape-altering wildfire. *Id*. at 6, 17-18, 22.
- To minimize the short-term adverse effects of these protective actions, the Cibola, before implementing each site-specific protective project, conducts FWS-protocol owl surveys to locate and protect individual owls during project implementation and designates PACs. *Id*. at 3, 8, 11-12, 22.
- After implementation of protective projects, post-project monitoring is conducted when practicable to ensure the desired effect of protecting habitat. *Id*. at 21.
- If, after local-scale, pre- and post-project monitoring, the treatment did not have the desired effects, the Cibola adapts its approach for future protective actions. *See* Defs.' Exh A, Ronald A. Maes Declaration ("Maes Decl.") ¶ 13; *see also* USFS AR 000139, 000467.

3. Likely Effects Of Cibola Forest Plan – Site-Specific Protective Projects

- Site-specific protective treatments, though critical to reducing the risk of high-severity wildfire, can have indirect short-term adverse effects to the owl through habitat modification and disturbance. ECF No. 112-1 at 6, 17-18.
- These protective treatments, however, result in long-term benefits by reducing the threat of high-severity, landscape-altering wildfire. *Id*. at 17-18.

- On the Cibola, protective treatments resulted in wildfire risk declines in the Gallinas Mountains of about 42% and 38% for the mixed conifer-frequent fire and ponderosa pine forest types, respectively. The risk of wildfire in these same two forest types also declined by about 5% and 7%, respectively, in the Manzano Mountains. ECF No. 112-1 at 13.

4. FWS's Jeopardy Conclusion Regarding the Cibola Forest Plan

- The owl's survival and recovery is directly tied to the protection and recruitment of nest/roost habitat – the primary objective in the 1995 and 2012 Recovery Plans. *Id*. at 21.
- The Cibola eliminated its commercial, even-aged timber harvest management actions and now implements actions designed to protect current and future nest/roost habitat. *Id*. at 6, 16, 17-18, 22.
- The Cibola's protective actions resulted in positive protective effects for the current and future nest/roost habitat. *Id*. at 13.
- Additionally, in over 20 years of implementing protective actions, known owl distribution across the range remained stable and additional owl surveys discovered more known owl nesting sites across a wider area throughout the owl's range. *Id*. at 11, 19.
- The implementation of protective actions consistent with the Cibola Forest Plan not only does *not* appreciably reduce the owl's prospects for recovery but advances it. *Id*. at 21-24, 27-28.
- Therefore, the Cibola Forest Plan is not likely to jeopardize the owl's continued existence. *Id*. at 21-24, 27-28. FWS's decision is consistent with ESA standards.

IV. Plaintiff's Misdirection Does Not Undermine FWS's Jeopardy Decision.

Plaintiff does not approve of the Cibola's efforts to protect the owl's current and future nest/roost habitat from high-severity, landscape-altering wildfire. In opposing these efforts, Plaintiff, apparently relying on the opinions of discredited and agenda-driven "experts," *see* ECF Nos. 111-1, insists that FWS is required to use broad-scale

population monitoring to avoid Section 7(a)(2) jeopardy by testing assumptions as to the impacts of local, site-specific protective treatments. Plaintiff offers no explanation whatsoever as to how this process would apply or play out. That is not surprising because, as explained below and in prior briefing, *see* ECF Nos. 104 and 111, Plaintiff's approach is unworkable and finds no support in the science or record.

A. Local-scale adaptive management vs. broad-scale adaptive management

Defendants offer the following delineation of the applicable adaptive management approaches through several scenarios to explain the complex, but extremely important, interplay between the two levels of adaptive management, their associated monitoring, and their different purposes.

1. Local-scale adaptive management for Section 7(a)(2) purposes

Local-scale adaptive management occurs when the Cibola designs and implements a site-specific protective project. As part of its proposed action – site-specific protective projects under the Cibola Forest Plan to protect current and future nest/roost habitat – the Cibola implements local, pre- and post-project monitoring to locate and protect owl individuals and all owl habitat. ECF No. 112-1 at 3, 8, 11-12, 22. If, after analyzing the monitoring results, a particular protective project did not accomplish its intended result of maintaining and improving owl habitat, the Cibola can utilize the information to adjust its approach for future actions where appropriate. USFS AR 000139, 000467.

2. Broad-scale adaptive management for Section 4 recovery purposes

Broad-scale adaptive management occurs when FWS assesses its overall owl recovery approach like, among other things, the general "how, where, and what" management recommendations that might be needed to combat broad-scale threats like high-severity wildfire, climate change, and drought, to current and future nest/roost habitat. As part of this analysis, FWS will analyze broad-scale population trend data. It will then analyze the current broad-scale trends against other broad-scale effects impacting the owl across its entire range like wildfire, drought, climate change, etc. FWS would then adaptively manage by tweaking its broad-scale recovery approach (if

necessary) and may recommend a different broad-scale management approach to USFS and other land management entities throughout the owl's range. *See* ECF No. 111 at 5-8.

Of the innumerable scenarios that could play out once FWS obtains reliable broad-scale population trend data (which, at least for National Forest land in Region 3, will not be available until 2023 at the earliest), we offer an example of broad-scale adaptive management should there be declining population trends, which may be instructive:

- **Declining broad-scale population trends in USFS Region 3**: FWS would compare this data to other broad-scale factors affecting the owl's habitat and prey species across the range – e.g., high-severity, landscape wildfire, broad-scale drought, broad-scale climate change, etc. FWS may find that the owl's declining broad-scale trend could be linked to a rapid loss of habitat across the range due to drought and high-severity wildfire. As a result, FWS would use this information to adapt its recovery approach. For example, in this scenario, FWS may recommend that USFS implement *more* protective projects in in recovery habitat (both future nest/roost replacement recovery habitat and foraging/dispersal recovery habitat). It may also recommend that USFS's protective efforts focus on potential higher-elevation habitats that are still somewhat insulated from rising ambient temperatures and may allow for future habitat under existing climate change scenarios.

Contrary to Plaintiff's assertion, broad-scale monitoring for broad-scale adaptive management is not designed to identify effects of site-specific protective projects implemented under the Cibola Forest Plan. *See* ECF 112-1 at 9. Rather, it is set up to track the effects of broad-scale threats on current and future nest/roost habitat like wildfire, drought, and climate change, and the how, where, and what type of protective actions best help combat those threats. *Id*.; *see also* ECF No. 111 at 5-8. And all of the record cites Plaintiff relies on to support its misguided argument, *see* ECF No. 120 at 5-6; ECF No. 121 at 8-16, when read in context, support the two-level adaptive management approach outlined above – the approach implemented since 1996. To be clear, FWS, when analyzing whether the proposed action – here, site-specific projects on the Cibola

designed to protect current and future nest/roost habitat – will appreciably reduce the prospects of owl recovery (a local, site-specific analysis) under Section 7(a)(2), it uses similarly scaled data to measure effects to owl individuals and its treated habitat and to adapt its local protective projects accordingly. Here, FWS did just that, *see supra* Section III, and its decision is consistent with the ESA and reasonable.

B. The Cibola BiOp's treatment of broad-scale population trend data is consistent with the 1996, 2005, and 2012 BiOps.

Plaintiff also argues that, like the 1996 and 2005 BiOps, the 2019 Cibola BiOp must require USFS to provide broad-scale population trend data as a condition for its "no jeopardy" determination. ECF No. 121 at 8-10. Again, that broad-scale data does not inform a local-scale analysis under Section 7(a)(2) on the potential effects of the Cibola's protective projects. And, contrary to Plaintiff's assertion, providing broad-scale population data was not part of FWS's jeopardy conclusion in the 1996, 2005, and 2012 BiOps. It is true that the agencies included an aspect of broad-scale population monitoring in the 1996 and 2005 incidental take statements. But, as explained, that was a mistake by the agencies. *See* ECF No. 111 at 8-10. Both agencies determined, through a normal iterative decision-making process, that the acquisition of broad-scale population data – while being a shared goal – was not appropriate in a local-scale incidental take statement. Incidental take statements track the take from site-specific actions that occur as a result of the action under Section 7(a)(2) consultation. Because the broad-scale population trend data cannot be used to track local-scale incidental take associated with individual forest plans, FWS appropriately removed it from the 2012 BiOps. To be clear, however, contrary to Plaintiff's claim, none of the actual "jeopardy analysis" sections of the BiOps (1996, 2005, 2012, 2019) are or ever were premised on USFS providing broad-scale population trend data. Rather, those decisions are premised on the analysis outlined above and have nothing to do with the acquisition of long-term, broad-scale population trend data. *See supra* Section III.

C. The agencies conduct the appropriate monitoring and mapping needed for

Section 7(a)(2) compliance.

Plaintiff continues to further muddle the monitoring and mapping issues. ECF No. 121 at 11, 12-16. First, Plaintiff incorrectly claims that the Cibola is not appropriately conducting FWS-protocol, pre-project surveys. In actuality, Plaintiff again cherry picks a statement from a 2017 Cibola report and omits critical explanation and context. ECF No. 121 at 11. The cited statement references a different type of narrow monitoring focused on specific aspects of the Cibola Forest Plan for a completely different purpose; it is not intended to meet FWS-survey protocol. Maes Decl. ¶ 15. Second, Plaintiff again accuses USFS of not doing more to determine the actual effects of protective projects like thinning. ECF No. 121 at 14-16. But USFS is conducting these experimental projects where practicable and using the information to adapt its management. *See* ECF No. 111-2 ¶¶ 6-10; Maes Decl. ¶¶ 11, 13. And, while both agencies acknowledge that the information is not perfect (which is *always* the case regardless of the listed species being analyzed), the fact remains that the indirect, short-term adverse effects to owl habitat resulting from projects designed to protect owl habitat pale in comparison to the significant harm to owl recovery from tens of thousands of lost current and future nest/roost habitat resulting from high-severity wildfire. ECF No. 112-1 at 6, 17-18.

Finally, Plaintiff's complaints regarding the agencies' mapping efforts, ECF No. 121 at 12-14, are predicated on cherry-picked excerpts which do not accurately reveal the full picture. The agencies know the locations of current and future owl habitat as referenced in the 2012 Recovery Plan. *See* Defs' Exh. B, Shaula Hedwall Declaration ("Hedwall Decl.") ¶¶ 9-11; *see also* USFS AR 7303-04, 7312-13. Because the owl's range extends well beyond National Forest lands in Region 3, a range-wide recovery habitat map requires information from many different conservation partners and jurisdictions – USFS, National Park Service, Bureau of Land Management, Native American Tribes, and States. *Id*. FWS works with these partners to develop and update habitat data and maps specific to those jurisdictions. *Id*. USFS, for its part, possesses the underlying owl-habitat data for each forest in Region 3 that conservatively predicts the

location of forested owl recovery habitat that meets the definition of recovery nest/roost habitat. Maes Decl. ¶ 11. USFS uses this data as an initial broad-scale starting point as it designs and implements site-specific projects. *Id*. ¶¶ 11. As part of this process, USFS staff gather the information, often in coordination with FWS biologists, then survey and ground truth the proposed project area to verify the specific boundaries of forested owl recovery habitat (mixed conifer and pine-oak forest types) that includes areas managed as recovery nest/roost habitat. *Id*. Based on this information, USFS then produces a project map that displays the location of critical habitat (PACs and recovery habitat within critical habitat unit boundaries), PACs, and recovery habitat (including both nest/roost replacement and foraging/dispersal recovery habitat). *Id*. USFS, cooperatively with the FWS, then designs projects that protect and/or develop foraging and nest/roost habitat. *Id*. The October 24, 2019 map referenced by Plaintiff is merely the most recent version of a forest-level recovery owl habitat for the Cibola that the Plaintiff requested. *Id*. This map was developed by applying all the most recent data layers and using the best currently available information. This approach is entirely consistent with the 2012 Recovery Plan.

D. Discovery is not appropriate.

Plaintiff's discovery request is improper. First, any discovery dispute should be addressed in a separate lawsuit challenging all future BiOps. Second, Plaintiff's request has nothing to do with the ESA's citizen-suit provision; rather, this effort is designed to attack the substance of superseding final agency actions brought under the Administrative Procedure Act ("APA"), 5 U.S.C. § 704. These types of claims are governed by the APA's scope and standard of review – i.e., no discovery. And Plaintiff has not demonstrated bad faith to circumvent the APA's record-review mandate. As explained, FWS, using the best available data and using local-scale data for a local-scale Section 7(a)(2) analysis, appropriately made a "no jeopardy" determination. If the Court is inclined to permit discovery, Defendants request an opportunity to fully brief this issue.

CONCLUSION

For all these reasons set forth above, Defendants' motion should be granted.

Dated: November 25, 2019

Respectfully Submitted,

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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF ARIZONA

WILDEARTH GUARDIANS, Plaintiff, v. UNITED STATES FISH AND WILDLIFE SERVICE and UNITED STATES FOREST SERVICE, Defendants.	CASE NO. 4:13-cv-151-RCC **CERTIFICATE OF SERVICE**

I hereby certify that I electronically filed the foregoing with the Clerk of the Court using the CM/ECF system, which will send notification of such to the attorneys of record.

/s/ Rickey D. Turner, Jr.
RICKEY D. TURNER, JR.

Defendants' Exhibit A

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF ARIZONA

WildEarth Guardians, Plaintiff, v. United Fish and Wildlife Service, et. al., Defendants.	)	No. CV-13-00151-RCC

DECLARATION OF RONALD A. MAES

1. I am currently employed by the United States Department of Agriculture, Forest Service, as Regional Threatened, Endangered, and Sensitive Species ("TES") Program Leader for the Southwestern Region ("Region"). I have held this position permanently for 10 months and have detailed into the position for a total of 2 years in the past. I have been involved in the TES program in the Southwestern Region for the past 17.5 years as the assistant TES Program Leader. This has included Endangered Species Act ("ESA") §7(a)(2) consultations for the Region's Land and Resource Management Plans ("LRMPs" or "Forest Plans") in 2004-2005 and 2011-2012. I have also served as a consultation biologist with the U.S. Fish and Wildlife Service ("FWS") for 3 years providing technical support to action agencies, writing concurrence

letters for informal consultations, writing biological opinions for formal consultations, and participating in the species status assessment process to inform all decisions and actions related to listed, proposed, or candidate species. In this capacity as TES Program Leader, I act as technical expert for the Region on conservation and recovery of species and their habitats, and on the impacts of land management actions on threatened, endangered, and sensitive species and their habitats.

2. I have reviewed the Plaintiff's Opposition to Federal Defendants' Motion to Dissolve Injunction for the Cibola National Forest ("NF"). The U. S. Forest Service ("USFS") has provided new or updated information for the Mexican Spotted Owl ("MSO", "spotted owl", or "owl") MSO habitat, designated MSO critical habitat ("CH"), information related to direct or indirect effects to the MSO and its CH from the implementation of the Cibola NF LRMP ("Action Area") since the 2012 Biological Opinion ("BiOp") was issued. The USFS also reviewed Cibola NF files to determine if any significant amendments to the Cibola NF LRMP had occurred since the conclusion of Endangered Species Act ("ESA") §7(a)(2) consultation in 2012. I seek to clarify the process used to develop the current Biological Assessment ("BA") for the continued implementation of the Cibola NF LRMP.

3. I believe it is prudent to again emphasize that the U. S. Forest Service is conducting this consultation under the ESA §7(a)(2). The regulations promulgated to implement ESA §7(a)(2) state that each Federal agency shall, in consultation with the Secretary [Interior or Commerce], insure that any action they authorize, fund, or carry out, is not likely to **jeopardize** the continued existence of a listed species or result in the destruction or **adverse modification** of designated critical habitat. 50 CFR §402. This applies to all federal actions including those not

intended to contribute to recovery of the species. Therefore, references to the failure of the adaptive management approach described in the 1995 MSO Recovery Plan to assess the effectiveness of the recovery plan, not the forest plans, are not applicable in these jeopardy and adverse modification analyses. The consultation is analyzing the impacts to the MSO and its designated critical habitat from the continued implementation of the Cibola NF LRMP that, in part, includes management recommendations (third leg on the stool of adaptive management) in the form of Standards and Guidelines ("S&G") and intended to protect the species and its habitat and contribute to recovery.

4. When reinitiation of ESA §7(a)(2) consultation (sometimes referred to simply as "section 7 consultation") is needed, required, or ordered, it is important to update the information for the environmental baseline for the species. The environmental baseline is "the past and present impacts of all Federal, State, or private actions and other human activities in an ***action area*** [emphasis added], the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation process." U.S. Fish and Wildlife Service Consultation Handbook. If current or updated information for the species or its habitat is available, it is included. The USFS provided the FWS with this information in the BA for the Cibola NF LRMP, i.e., information to update the environmental baseline. The FWS will then consider the effects of the action along with the environmental baseline and the predicted cumulative effects in determining the overall effects to the species for the purposes of preparing a biological opinion ("BiOp") for the proposed action. [50 CFR §402.02]

5. The USFS manages habitat for populations of the MSO in Arizona and New Mexico. The MSO also occurs in the States of Utah and Colorado as well as the country of Mexico. The USFS only contains a ***portion of the range*** of the species. The expectation that the USFS conduct long-term, ***range-wide*** population trend monitoring is both unreasonable and impracticable. The USFS is currently contributing to the collection of information on populations for MSO on National Forest System ("NFS") lands in the Southwestern Region. See Annual Reports Attached. This is a subset of what is required for the FWS to assess delisting for the species. Therefore, the long-term, range-wide population trend monitoring and the adaptive management process in the jeopardy analysis for the effects of the Cibola NF LRMP is not applicable based on ESA law, regulation, and policy. Protective measures and active management recommendations are the other components of the recovery objectives (adaptive management strategy) of the 1995 Recovery Plan. To imply that implementing these measures is in no way contributing to the conservation and recovery of the MSO is absurd and there exists an illogical argument that the implementation of the management recommendations for the species without the monitoring of population trends in no way contributes to recovery. Regardless, the USFS is doing both.

6. The Federal Defendants' in no way imply that long-term, range-wide implementation of the adaptive management program is not essential for the conservation and recovery of the MSO and the success of the recovery plan. We simply state that compliance with the statutory requirements of ESA §7(a)(2) does not require a recovery analysis to determine jeopardy to a listed species. The facts support this determination and *insuring* against jeopardy does not include a "route to recovery" under ESA §7(a)(2) consultation. *See Idaho Department of Game*

and Fish v. National Marine Fisheries Service. The 9th Circuit determined that "[W]here section 7 consultation parameters end and section 4 recovery measures begin is not a proper matter for judicial bright-line decision making and in any event, such a distinction should not be premised upon the nature or quality of an agency activity, but instead, pursuant to the mandate of the ESA." Imposition of a recovery analysis in the section 7 consultation process is a misapplication of the law that the Plaintiff has effectively confounded in their arguments with the required section 7 jeopardy analysis.

7. The Cibola NF owl surveys are not intended to stand in for long-term, range-wide population trend monitoring. Surveyors for the Cibola NF use the FWS approved survey protocol in terms of methodology. Owl surveys typically occur during inventory of the proposed project area and fall into the category of surveying spotted owl habitat to inform the analysis if occupancy is detected (i.e., inventory of the analysis area). The informal surveys, referred to in the Opposition to Dissolve Injunction for the Cibola NF, occur in Protected Activity Centers ("PAC") for project implementation monitoring, for example. ECF Doc. 112, Page 9, Line 9. The number of PACs monitored and which PACs are monitored changes from year to year for various reasons. The USFS presented this to the FWS as the best available information related to the status of the species in the action area and not as a substitute for long-term, range-wide population monitoring. The inventory of potentially occupied MSO habitat and project-level monitoring is helpful in assessing distribution of the owl across the forest or action area and may be useful for the jeopardy analysis for the Cibola NF LRMP.

8. Designation of PACs and protection of those areas shouldn't be described as a deficiency. It is a part of the management recommendations in the 1995 MSO Recovery Plan

and the 2012 Recovery Plan, First Revision. Therefore, it is not a substitute for the adaptive management program but a part of it. It is, however, very helpful in conducting the jeopardy analysis during the section 7 consultation process. This component of the Cibola NF LRMP protects and manages occupied habitat to contribute to recovery.

9. The Cibola NF LRMP also contains components for areas outside of occupied habitat that are described as protected habitat, restricted habitat, and other forests and woodlands. See definitions in ECF 111, Maes Declaration at 5-6. Within those areas, the Cibola NF does contain plan components to protect and develop foraging, nesting, roosting, migration, and wintering habitat. The emphasis on occupied areas with nesting and roosting habitat was due to the loss of that habitat component under LRMPs prior to the 1996 amendment for all of the Region's LRMPs. The USFS has required the protection and development of nesting and roosting habitat outside of PACs and this does provide contributions to recovery in support of increasing populations. Statements indicating that the USFS is only protecting PAC habitat are patently false.

10. Surveys on the Cibola NF are not intended to satisfy range-wide population trend monitoring and the surveys that provided monitoring information at the project-level are not represented as such. Detecting nonbreeding owls is very difficult. Therefore recovery objectives and management recommendations provide for habitat that is capable of supporting MSO during all life stages and throughout NFS lands of the Southwestern Region. Additionally, the surveys are consistent with the methodology in the FWS approved Survey Protocol. Also, there is neither distinction nor description of "formal" and "informal" surveys in the current survey protocol. See attached Survey Protocol. Attachment 3.

11. Data layers that are used to identify recovery habitat for the MSO have existed for many years. Recovery nest/roost habitat is identified specifically during project implementation and is consistent with the management recommendations in both Recovery Plans. Prior to the 2012 MSO Recovery Plan, First Revision, recovery habitat was defined as protected habitat outside of PACs and restricted habitat. The recovery habitat maps developed for this LRMP consultation use the most recent data layers for the Cibola NF. This data layer was developed by the Institute for Natural Resources using Existing Vegetation ("INREV"). The USFS used INREV data to develop recovery habitat maps consistent with the 2012 MSO Recovery Plan. Prior to the development of the INREV data, the USFS used other data layers to develop mapping of recovery (restricted and protected) habitat at the project level. Therefore, stating that recovery habitat for the Cibola NF, or any other forest in the Region, has not been identified and managed at a landscape scale is also patently false. Recovery habitat maps were created in pdf format using the INREV data for the Plaintiff on October 24, 2019, at their request. Presuming that the data necessary to develop this type of map did not exist prior to October 24, 2019, is also patently false. The development of maps using the INREV data layers have been developed and were made available to the Plaintiff. These data layers were also used at the District scale and provided to the FWS along with tabular information to conduct an analysis of effects for the continued implementation of the Cibola NF LRMP. Because the LRMP provides the framework for developing projects that move areas toward a desired condition, site-specific treatments are not defined in the LRMP. Tabular information describing the amount and types of MSO habitat is typically what is described to conduct an analysis at this level. The USFS possesses the underlying vegetation type, size, and canopy cover, coupled with the topographic and geological

data for each forest in Region 3 to conservatively predict the locations of forested (and canyon) recovery owl habitat. This landscape-scale view conservatively incorporates all areas that contain mixed conifer and pine-oak types regardless of whether they possess the characteristics of nest/roost habitat. In many cases, the recovery habitat area has been grossly over-represented because of the coarse scale limitations of the data to identify areas that actually possess the characteristics of MSO habitat. Once finer scale data is collected such as stand exam data, ground truth information will be more accurately represented. This finer scale information is contained within several data layers, the most recent is the INREV data described above. Using this underlying data layer, the USFS can filter the general vegetation types (e.g., mixed conifer and pine-oak) to identify areas within these vegetation types that contain the characteristics of nest/roost habitat. Nest/roost habitat is typified by well-structured forests with high canopy cover, large trees, and other late seral characteristics, or in steep and narrow rocky canyons formed by parallel cliffs with numerous caves and/or ledges within specific geologic formations. Ecological Response Units (ERU) is a mapping feature class that is an ecosystem mapping tool for forests across Arizona and New Mexico. ERUs are used to define historic/reference conditions within a mapping unit by integrating site potential (soil physical and chemical properties, geology, geomorphology, aspect, slope, climate variables, and geographic location), fire regime (historic and contemporary), neighboring vegetation communities, and seral state sequence. This also can be used to inform the process of identifying areas to meet the definitions of MSO recovery habitat for nesting/roosting, foraging, dispersal, wintering, and migration. Prior to the use of INREV and ERU data, Region 3 used data layers gathered through the General Terrestrial Ecosystem Surveys ("GTES"), Terrestrial Ecological Unit Inventory

("TEUI"), or the Regional coverage called "GenVeg" with is a combination of the GTES and TEUI data . The GTES data has been available since the early 1990s, but it is a much more coarse data layer than what is used currently (i.e., 1:250,000 scale for GTES versus 1:24000 for TEUI). Nonetheless, the coarse filter information has been available for about three decades. But, regardless of the coarse filter data source used, it all requires some level of ground-truth information to accurately identify the various types of MSO habitat for site-specific management projects. See example of a map that was developed for the Rio Penasco II Project on the Lincoln NF. Attachment 9 and 10. Shaded areas represent recovery habitat outside of PACs proposed for treatment and the hatched areas are those managed for recovery nest roost habitat (amounts to 25% of the recovery habitat in the analysis area).

12. The superseding BiOp and its jeopardy analysis are compliant with the regulatory requirements of ESA §7(a)(2). Nonetheless, a failure to acknowledge the USFS's efforts over the past six years to collect site occupancy population monitoring information across National Forest System lands is an omission that may play well into arguments prior to 2012. Despite the argument that the USFS should be conducting long-term, range-wide monitoring of any kind for the MSO, the USFS is contributing its part to the adaptive management scheme in the 2012 MSO Recovery Plan. See excerpts from Annual Reports, Attachments 2-6. Omission of this fact is ethically and morally reprehensible, dishonest, and a blatant misrepresentation of facts.

13. Information for treatment effects does exist, was collected prior to the 2012 revision of the MSO Recovery Plan, and continues to be collected. ECF 111, Pages 10, 11, 12, and Attachments in Defendants Exhibit D, Maes Declaration. Volumes of treatment effects data have also been collected for pre- and post-treatment effects to microhabitat for the MSO. This has

also been described but ignored by Plaintiff to seemingly support their argument that a robust adaptive management program does not exist. Perhaps it is in hopes that the analogy of a pig in search of truffles and tidbits provides support to a false argument and a failure to examine the record and all information submitted in support of motions filed with the Court. Perhaps an examination of the facts as presented since the 2012 MSO Recovery Plan was finalized would be useful in determining if the Federal Defendants' have truly met the Court's terms of the order.

14. Arguments in the Plaintiff's Opposition to Dissolve Injunction for the Cibola NF LRMP wander aimlessly from range-wide population trend monitoring to project implementation monitoring to surveys, Forest Plan implementation monitoring (a new type of monitoring seemingly introduced to confuse the differences between the various survey and monitoring efforts), adaptive management, recovery analyses in ESA §7(a)(2) consultation, funding of studies (research) on the impacts of restoration treatments, and other arguments in such a convoluted manner that even those of us familiar with and knowledgeable of the processes are left scratching our heads in an attempt to decipher the arguments.

15. The following is the Executive Summary from the same report cited in the Motion Opposing Dissolution of the Cibola NF from the injunction: "The monitoring and evaluation report for fiscal year 2017 (FY 2017) gives monitoring results for land and resource management activities important to achieving Forest-wide goals stated in the 1985 Cibola National Forest Land and Resource Management Plan (1985 Cibola Forest Plan) and grasslands-wide desired conditions stated in the 2012 Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands Plan (2012 Cibola Grasslands Plan). The monitoring elements and questions addressed in this report are on pages 199-229 of the 1985 Cibola Forest Plan and pages 113-125

of the 2012 Cibola Grasslands Plan." The introduction to the monitoring plan in the Cibola NF LRMP at pages199 states, "[T]he purpose of monitoring and evaluating the implementation of the Forest Plan is to inform the decision maker of the progress toward achieving the goals, objectives, and standards and guidelines." The goals, objectives, and standards and guidelines were developed to move conditions on the forest toward the desired conditions for all resource areas. Attachments 7 and 8. That is, the monitoring and evaluation plan for the Cibola NF is to assess the implementation of the Forest Plan and provide information on the progress toward the desired conditions for all resource areas of the forest planning area; it has nothing to do with FWS-protocol surveys implemented before a fuels reduction or forest restoration project nor does it have anything to do with monitoring trends associated with the range-wide area for the MSO.

16. Federal Defendant's provided the Court with the superseding BiOp for the Cibola NF LRMP according to the terms of the order filed on September 12, 2019 reassessing the jeopardy analysis and the effects of the Forest Plans on the recovery of the MSO.

17. Pursuant to 28 U.S.C. §1746, I certify under penalty of perjury that the preceding is true and correct.

Executed this 25nd day of November 2019.

Ronald A. Maes
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Attachment 1

MEXICAN SPOTTED OWL SURVEY PROTOCOL
U.S. FISH AND WILDLIFE SERVICE, 2012

INTRODUCTION

The following field survey protocol is designed for detecting Mexican spotted owls (hereafter, "owl"; *Strix occidentalis lucida*) and for surveying areas where human activities might remove or modify owl habitat, or otherwise adversely affect the species. The owl was federally listed as threatened on March 16, 1993 (58 FR 14248). Federal agencies are not required to conduct surveys for listed species prior to preparing a biological assessment under the Endangered Species Act ["Act"; see 50 CFR 402.12(f)]. However, Federal agencies are required to provide the best scientific information available when assessing the effects of their actions to listed species and critical habitat [50 CFR 402.14(d)]. In the absence of necessary information, the U.S. Fish and Wildlife Service (FWS) gives the benefit of the doubt to the listed species [H.R. Conf. Rep. No. 697, 96th Cong., 2nd Sess. 12 (1979)].

This survey protocol expresses the FWS's scientific opinion on adequate owl survey methods and includes guidance and recommendations. It does not constitute law, rules, regulations, or absolute requirements. Our knowledge is continuously developing and changing; therefore, this protocol, which is based upon the best scientific data available, is a work in progress. This protocol will be modified as new information becomes available. The public will be notified of changes to the protocol through postings to the FWS's Arizona Ecological Services Field Office (AESO) (http://www.fws.gov/southwest/es/arizona/). We encourage submissions to us (email submissions to Shaula_Hedwall@fws.gov) at any time of any information that can add to our understanding of what is needed to provide for long-term conservation of this species and its ecosystem. Persons conducting owl surveys must be covered under a research and recovery permit under Section 10(a)(1)(A) of the Act in order to avoid unauthorized harassment of owls, which could violate the prohibitions of Section 9 of the Act. However, no other Federal permitting requirements are implied, though individual states might have their own permitting requirements. Circumstances dictate how owl surveys are implemented. If surveys cannot be accomplished pursuant to this protocol, we recommend contacting the nearest FWS Ecological Services Field Office (ESFO) for guidance on additional survey methods before proceeding.

The FWS endorses the use of this protocol for obtaining information on owl occupancy within and adjacent to proposed project areas. This protocol helps the public and agency personnel determine whether proposed activities will have an impact on owls and/or owl habitat. A properly conducted survey will help agencies determine whether or not further consultation with the FWS is necessary before proceeding with a project. Any information on owl presence within and/or adjacent to the proposed planning or activity areas is important, even if it does not meet the guidelines described below. However, if the only owl location information available for a proposed project was acquired through surveys not conducted in accordance with this protocol, the FWS may conservatively assess the impacts of the proposed management activity on owls, (e.g.) assume the species is present in or near the action area if the best available information makes such an assumption reasonable. This survey protocol is not designed for monitoring owl population trends or for research applications.

The generally accepted protocol for inventorying Mexican spotted owls was developed by the Southwestern Region of the U.S. Forest Service (FS) in 1988. The protocol was revised in 1989 and in 1990 it was appended to the Forest Service Manual. The protocol, as an element of Interim Directive No. 2, had an official duration of 18 months but has served as the guidance accepted by most agencies and individuals conducting surveys for owls on public lands throughout Arizona, New Mexico, Utah, and Colorado through 2003. The FS reissued the inventory protocol in 1994, again in 1995, and then issued the latest version in February 1996. The FS incorporated recommendations from the draft and subsequent final Recovery Plan for the Mexican Spotted Owl (USDI FWS 1995) regarding the designation of protected activity centers (PACs) around owl locations but did not modify the overall survey design.

Through application of and the use of the data gathered by the existing protocol under informal and formal consultations under Section 7 of the Act, the FWS has found instances where the refinement of the protocol would benefit both the species and those working with it. On January 26, 1998, the FWS met with a group of experts to review the FS protocol and available literature and to improve and update the document. The following draft document is the result of those discussions and subsequent review by FWS biologists and Mexican Spotted Owl Recovery Team members.

This protocol provides a FWS-endorsed method to: 1) make inferences regarding the presence or absence of owls in a defined area; 2) assess occupancy and nesting status, and locate nests, in areas where habitat alterations or disturbances to owls are likely to occur; and, 3) provide information to allow designation of PACs.

The primary objective of conducting surveys using this protocol should be to locate and observe the nest of a Mexican spotted owl or young. These observations provide the most reliable and efficient information for documenting presence and delineating potential nest core areas or roost sites (Ward and Salas 2000). Because spotted owls do not nest every year, the alternative, and often default outcome, is to observe adult or subadult spotted owls at daytime roosts. However, it can take up to four years of roost location data to effectively delineate owl core activity areas (Ward and Salas 2000). Locating a resident owl's nest or young may be accomplished most effectively using the mousing technique described in the protocol below (and see Forsman 1983). The mousing technique requires that personnel are trained in proper care and handling of live animals for research, and that, when conducting daytime follow-up surveys, they procure and carry "feeder" mice into the field (American Society of Mammalogists 1998, National Academy of Sciences 1996).

Individuals surveying for owls should meet certain training standards. Experience will be reviewed and approved during a surveyor's application for an FWS issued Section 10(a)(1)(a) recovery permit. These standards strongly encourage surveyors to have knowledge of this protocol and the ability to identify owls visually and vocally, determine sex and age of owls, imitate vocal calls of the owls if not utilizing a tape recording of the calls, and identify other local raptor species. Orienteering skills, including use of map, compass, and/or Global Positioning System (GPS) units, are essential. Surveyor safety should be of primary importance. Those surveying for owls who do not meet these training standards could "take" owls by

harming or harassing them, resulting in criminal or civil penalties.

MEXICAN SPOTTED OWL SURVEY PROTOCOL

The most efficient way to locate owls is to imitate their calls (Forsman 1983). The owl is territorial and responds to imitations of its common vocalizations. Night calling is used to elicit responses from owls and locate the general areas occupied by them. Daytime follow-up visits are used to locate roosting and/or nesting owls and to further pinpoint the activity centers of individual owls. If owls are located, mice are offered to them to locate mates, nests, and young. The information collected from nighttime calling surveys and daytime follow-up surveys assist biologists and land managers to determine whether areas are occupied or unoccupied by owls and to determine the owl's reproductive status.

Throughout this protocol, all bold-faced terms are included in the glossary. Only the first use of the term is bold-faced. An outline summarizing the primary steps for implementing the protocol appear below.

1. Survey Design

The survey design uses designated **calling routes** and **calling stations** to locate owls. The intent of establishing calling routes and calling stations is to obtain **complete coverage** of the survey area so that owls will be able to hear a surveyor calling and a surveyor will be able to hear the owl(s) responding.

A. The survey area should include all areas where owls or their habitat might be affected by management actions. If an area is relatively large, it can be subdivided into manageable subunits to achieve the best survey results. In general, the survey area should include the survey area and an 800-meter (0.5-mile) area from its exterior boundaries. Within the project area, all areas that contain forested **recovery habitat**, riparian forest, and canyon habitat, or might support owls, are surveyed as defined in this revised Recovery Plan. Descriptions of owl habitat for different areas and physiographic provinces should be available from various state and Federal wildlife agencies.

   Where known **protected activity centers (PACs)** exist within the survey area, calling routes can be adjusted to lessen disturbance to established PACs.

B. Owl surveyors should establish calling routes and calling stations to ensure complete coverage of the survey area. The number of calling routes and calling stations will depend upon the size of the area, topography, vegetation, and access. Calling stations should be spaced from approximately 400 meters (0.25 mile) to no more than 800 meters (0.5 mile) apart depending upon topography and background noise levels. Nighttime calling routes and calling stations should be delineated on a map, reviewed in the field, and then relocated, as necessary, to improve the survey effectiveness.

2. Survey Methods

Owls are usually located using nocturnal calling surveys where a surveyor imitates the territorial calls of an owl (Forsman 1983). Upon hearing a suspected intruder within their territories at night, most owls respond by calling to and/or approaching the intruder.

A. CALLING

1. Owls call during all hours of the night. However, optimal survey times include two hours following sunset and two hours prior to sunrise, and surveys should be concentrated around these periods.

2. Surveys should use nighttime surveys for all calling routes in the survey area unless safety concerns dictate that a daytime survey is necessary.

3. Calls can be imitated by the surveyor or by playing recordings of owl vocalizations. If a tape recorder is used, both the tape and tape deck used should be of high quality. Tape decks should have a minimum output of 5 watts (Forsman 1983).

4. The vocal repertoire of owls consists of a variety of hooting, barking, and whistling calls (Ganey 1990). Three call types accounted for 86 percent of calling bouts heard in Arizona: four-note location call, contact call, and bark series. The four-note call appears to be used the most frequently by owls defending a territory. It is suggested that surveyors use all three of these calls during surveys, with the four-note call as the primary call.

5. Surveyors should discontinue calling when a potential owl **predator** is detected, and should move on to another calling station out of earshot of the predator before resuming calling. Surveyors should return at a later time to the station(s) skipped to complete the calling route.

6. Surveyors should avoid calling for owls during periods of rain or snow, unless there is only a light misting of rain or snow that would not affect the surveyor's ability to detect owls. Surveying during inclement weather could prevent a surveyor from hearing owl responses and reduce the quality of the overall survey effort. Negative results collected under inclement weather conditions are not adequate for evaluating owl presence**/absence**. There is also the added risk of inducing a female owl to leave the **nest** during inclement weather and potentially jeopardizing nesting success.

7. Calling should not be conducted when the wind is stronger than approximately 24 km (15 miles) per hour or when the surveyor feels that the wind is limiting their ability to hear an owl. Consider using the Beaufort Wind Strength Scale. Level 4 describes winds 21 to 29 km (13 to 18 miles) per hour as a moderate breeze capable of moving thin branches, raising dust, and raising paper.

B. SURVEYS

To ensure complete coverage of the survey area, surveyors should select the best survey method for the situation and/or terrain. An owl survey might require a combination of methods, which are defined below, including: 1) calling stations; 2) continuous calling routes to obtain complete coverage of an area; and, 3) leapfrog techniques. Each of these methods is designed for nighttime calling and involves calling for owls and listening for their responses. All surveys where occupancy status is unknown should include nighttime calling.

It is imperative that, whatever method is used, surveyors actively listen during owl surveys. Owls may respond only once; therefore, surveyors must concentrate on listening at all times during surveys. In addition to active listening, surveyors should watch for owls that might be drawn in but do not respond vocally.

1. CALLING STATIONS

a. **Spacing** - Calling stations should typically be spaced approximately 400 meters (0.25 mile) to no more than 800 meters (0.5 mile) apart depending on topography and background noise. In some situations (i.e., complex topography, etc.), establishing calling stations <400 meters apart and more calling stations increases the likelihood of detecting owls. In canyon habitat, if surveying from the canyon bottom, stations should be placed at canyon intersections. If surveying canyons from the rims, calling stations at points and canyon heads should be included.

b. **Timing** - Surveyors should spend at least 15 minutes at each calling station: 10 minutes calling and listening in an alternating fashion, and the last 5 minutes listening. Owl response time varies, most likely because of individual behavior. Some owls will respond immediately, some respond following a delay, and some do not respond. In canyon habitat, it is recommended that surveyors spend a minimum of 20 minutes (30 minutes, if possible) at each station.

c. **Visitation** - Vary the sequence of visitation to calling stations, if possible, during subsequent visits to the area. For example, the order of the calling stations can be reversed. Varying the order of calling stations avoids potential bias related to time of night or other factors.

d. **Intermediate calling stations** should be used when factors decrease the probability of achieving complete coverage using the originally designated stations, or as triangulation points for determining nighttime owl locations. Use of intermediate calling stations can increase the likelihood of detecting owls and, thus, allow for stronger inference regarding the absence of an owl within the area.

2. CONTINUOUS CALLING METHOD

In some cases, using continuous calling is appropriate. Continuous calling involves

imitating owl calls at irregular intervals while walking slowly along a route and stopping regularly to listen for owl responses. Because of the sounds produced by walking (e.g., snapping twigs, pinecones, etc.), surveyors utilizing this calling method must concentrate on active listening. In canyon habitat, the continuous calling method is only recommended when combined with calling stations.

a. The surveyor should walk slowly (5 km per hour [3.3 miles per hour]) so as to minimize the possibility that an owl responds after surveyors are out of hearing range (i.e., allow time for owls to respond).

b. The surveyor must stop regularly (400 meters [0.25 mile]) along the route to listen for owl responses.

3. LEAPFROG METHOD

The leapfrog method is very useful when roads allow for coverage of all or a portion of the survey area. This method requires two people and a vehicle.

a. One surveyor is dropped off and begins calling while the other person drives the vehicle ahead at least 800 meters (0.5 mile). The second person then leaves the vehicle for the first person and proceeds ahead while calling.

b. Each surveyor should follow the continuous calling method. The first person continuously calls as he or she walks towards the vehicle, drives the truck at least 800 meters (0.5 mile) past the second person (i.e., "leapfrogs"), leaves the vehicle there and resumes calling along the survey route.

c. Surveyors should repeat this procedure until complete coverage of the survey area is accomplished.

3. Number and Timing of Surveys

Owl detection rates change with season, owl activity, and habitat. Ganey (1990) found that calling activity was highest during the nesting season (March-June). Information from past survey efforts indicate that owl response can also vary with habitat type and/or reproductive chronology (Fig. D.1). Generally, late March through late June is the optimal time period to detect owls. Surveys conducted during March-June will increase the likelihood of detecting owls. Additionally, if owls are not detected when surveys are conducted properly and at these peak times, then inferences about absence of owls in a given area will be stronger. It should be noted that responses in September can be used only to document presence. Surveys in September are not reliable for locating nests, delineating PACS, and/or inferring absence.

Specific criteria on number and timing of surveys are used to determine whether a **complete inventory** has been accomplished. A complete inventory requires that at least four properly scheduled complete surveys be accomplished annually for two years. Additional years of surveys strengthen any inferences made in cases where owls are not detected. If habitat-

modifying or potentially disruptive activities are scheduled for a particular year, the second year of surveys should be conducted either the year before or the year of (but prior to) project implementation. In other words, projects should occur as soon as possible after completion of surveys to minimize the likelihood that owls will be present during implementation. If more than five years have elapsed between the last survey year and the initiation of the proposed action, then one additional year of survey is recommended prior to project implementation.

A. In compliance with the guidelines in B through G below, surveyors should conduct four **complete surveys** during each breeding season. A complete survey can be a combination of a pre-call (daytime reconnaissance of habitat to be night called), a nighttime calling survey, and, if owls are detected, a **daytime follow-up survey**. If owls are not detected during daytime calling, night calling must be completed. However, if owls are located during a pre-call, night calling of the survey area is not required. Surveyors might want to conduct additional surveys if there is evidence that additional owls remain undetected in the area.

B. The four complete surveys must be spread out over the breeding season (1 March - 31 August) by following one of three recommended scheduling scenarios:

    1. Conducting two to four surveys during 1 March - 30 June, with no more than one survey in March. Owl calling activity tends to increase from March through May (Ganey 1990), so this time period is optimal for locating owls.

    2. Completing all surveys by 31 August, with no more than one of the four required surveys conducted during each of the months of July and August. Owl response rates tend to decrease by July (Ganey 1990). By September, juveniles have usually dispersed and adults are not necessarily on their territories. If additional surveys are added (e.g., more than the recommended four surveys), more than one complete survey could be completed in August.

    3. Allowing at least five full days between surveys. For example, assume a visit ends on 30 April. Using a proper five-day spacing (1-5 May), the next possible survey date would be 6 May (see section 3.D below for an exception to this rule).

C. A complete survey of the area should be conducted within seven consecutive days. If the area is too large to be surveyed in seven consecutive days, it should be divided into smaller subunits based on available owl habitat, topography, and other important factors.

D. In **remote areas,** surveyors can conduct two complete surveys during one trip into the area, so long as surveyors allow a minimum of two days between complete surveys. Conduct all field outings required for a complete survey prior to repeating any route for the second survey. Wait a minimum of 10 days before starting the next two surveys. **Areas defined as remote should be cleared with the FWS prior to proceeding with this deviation from the survey protocol.**

E. The two- to three-hour periods following sunset and preceding sunrise are the peak owl calling periods and the best times to locate owls in or near day **roosts** or nests.

F. Surveys can be discontinued in a given area when data indicate that the entire survey area is designated as PACs.

G. Vocal or visual locations of owls outside the breeding season (1 September - 28 February) as extra information can be of assistance in locating nesting owls in the upcoming breeding season.

4. Methods After Detecting a Mexican Spotted Owl

Once an owl has been detected, the following should be done:

A. Record the time the owl(s) was first detected, the type(s) of call(s) heard (if any), the owl's sex, and whether **juveniles** were detected.

B. Record a compass bearing from the surveyor's location to the location where the owl was heard and/or visually observed. If possible, triangulate the owl's location, taking compass bearings from three or more locations and estimate the distance to the owl. Record both the location where the owl responded from and the surveyor's calling location and triangulation locations on a map or photo attached to the survey form. The surveyor should know her/his location at all times. Triangulating provides an accurate means to map the owl's location. Attempt to confirm the presence of the owl(s) with a daytime follow-up visit (see section 5 below). Daytime owl locations, particularly of nests and young of the year, are very important in determining activity centers.

C. If the owl is heard clearly, and the call type and direction are confirmed, there is no need to continue calling. If, however, there is some doubt as to whether a response was detected, or from which direction, the surveyor should listen carefully for a few minutes, as an owl may call again if given the opportunity. If the owl does not respond after two to five minutes, the surveyor should continue calling to confirm owl presence and better assess the direction of the call. Do not call any more than is necessary. By stimulating the owl(s) to move you may harass a female owl off a nest or increase an owl's risk of predation.

D. Owls may move before or after they begin calling. Every effort should be made to estimate the location of the owl when the first response was heard. After you have determined the owl's location (see section 4.B above), move approximately 800 to 1,200 meters (0.5 to 0.75 mile) away (depending upon topography) before continuing surveys to avoid response by the same owl. If the owl responds from the original detection area, then move farther away before continuing to call.

E. Record the approximate location (bearing and distance), sex, age, and species of all other raptors heard in the survey area.

F. Conduct a daytime follow-up survey as soon as possible (see section 5 below).

5. Conducting Daytime Follow-up Surveys

As with nighttime surveys, follow-up daytime searches ensure quality of results and standardization of effort. Calling to elicit territorial responses is also used during daytime follow-up visits. A daytime follow-up survey helps locate owl roosts, nest sites, and young of the year (during 1 Jun - 1 Aug) by conducting an intensive search within the general vicinity of the original night response location. Owls tend to be more active in the early morning and late evening. During the day, owls are sleepy and do not always readily respond to calling, especially on warm days. Therefore, it is critical that surveyors conduct a thorough daytime search of the response area. Surveyors should spend enough time within the response area to cover all habitats within at least an 800-meter (0.5 mile) radius of the response location. This involves walking throughout the area, calling, listening, and watching for owl sign (e.g., whitewash, pellets, etc.). The FWS recommends that a minimum of one hour be spent searching for owls (regardless of the number of people surveying).

A. Complete a daytime follow-up survey as soon as possible, but within a maximum of 48 hours after owls are detected during nighttime surveys. The optimum daytime follow-up time is the morning following the nighttime detection. In general, the longer the time delay between the nighttime response and daytime follow-up survey, the smaller the probability of locating the bird and finding its roost or nest location. This is especially true if the owl(s) are not nesting. If the daytime follow-up survey is performed longer than 48 hours after the nighttime detection and no owls are found, the survey is considered incomplete and the survey must be re-done.

B. Conduct daytime follow-up surveys in the early morning or late afternoon/early evening. The optimal dawn period is 0.5 hour before sunrise to two hours after sunrise and the optimal dusk period is two hours prior to sunset; each daytime follow-up visit should include one of these time periods. Investing time in searching for the owl during these times will provide a more reliable inference of absence in the case where the owl cannot be located. For areas where spotted owls have been observed during the daytime during previous years, an initial survey in late April through mid-May can often elicit a response. However, non-responses are not that meaningful in documenting absence without nighttime surveys because owls could have moved to another nesting or roosting grove. Initial daytime surveys can be an efficient way to start each survey season where owls have been found in the past. If the initial daytime survey is unsuccessful (i.e., no response is heard), then nighttime surveys should be used to locate owls before attempting additional daytime surveys.

C. The search area for a daytime follow-up survey is a specific, smaller area within the broader survey area in which an owl was detected.

    1. Minimum search area is all recovery habitat within at least an 800-meter (0.5-mile)

radius of a nighttime owl response.

2. The search area should center on the location of the owl or owls that were heard during the nighttime survey. If there is some uncertainty, focus the search on the best nesting and roosting habitats (e.g. see Ward and Salas 2000).

3. Aerial photos and maps of the area should be studied to identify habitat patches and topographic features, such as canyons or drainages, to prioritize daytime survey locations. In forested areas, spotted owls often roost in first- and second-order tributaries (Ward and Salas 2000).

D. To conduct a thorough search for owls, the surveyor should systematically walk and call all forested recovery, riparian forest, and canyon habitats within the search area. As with nighttime surveys, be aware that owls often fly into the area to investigate; thus, surveyors must also attentively watch for owls. Surveyors should also search for signs of owls such as pellets, white wash, or molted feathers. However, pellets and whitewash alone are not sufficient to document owls. Mobbing jays or other birds can also be a sign that an owl is present.

E. If a daytime follow-up visit is not completed for any reason, or the search effort was not thorough because of the presence of predators or weather, a second follow-up visit should be conducted as soon as possible.

F. If no owl(s) are located during complete daytime follow-up visits, the surveyor should return to conduct nighttime surveys. Four complete surveys to an area are recommended by the survey protocol, but surveyors should assess the confidence of the nighttime and daytime responses and determine if additional nighttime surveys are needed to more accurately determine the location of the responding owl(s). Field personnel conducting surveys need to be given the flexibility to return as many times as necessary to find the owl(s).

G. As with nighttime surveys, daytime follow-up surveys should not be conducted in inclement weather and surveyors should avoid calling when potential owl predators are present.

H. Surveyors should minimize the amount of incidental disturbance to owls. For example, surveyors must not linger in nest sites or over-call in an area.

6. Methods If Mexican Spotted Owls Are Located on a Daytime Follow-up Visit

Mousing is the primary tool to locate an owl's mate, young, and/or nest. Mousing entails feeding live mice to **adult/subadult** owl(s) and observing the owl's subsequent behavior. Surveyors should be prepared to offer four mice (one at a time) to at least one member of the pair or to a single owl located on the daytime follow-up visit. For surveyors to draw conclusions about reproductive status, the owl must take at least two mice before refusing them. A mouse is considered "refused" if, after 30 minutes, it has not been taken by an owl.

If an owl takes a mouse and flies away, the surveyor should follow it as closely as possible to

determine where it takes the mouse. If the surveyor is unable to follow the owl, and doesn't know if it took the mouse to a mate, nest, or fledged young, then the fate of that mouse cannot be counted toward the four-mouse minimum described above. Surveyors should be ready to rapidly pursue owls that take mice, as owls sometimes fly several hundred meters with mice to reach their nests or young. It is not necessary to complete the four mice minimum after a mouse has unequivocally been taken to a nest.

Owl pairs are determined to be non-nesting if a single owl eats and/or caches all four mice or eats and/or caches two mice and refuses to take a third. A mouse is cached when the owl puts the mouse in a tree or on the ground and then leaves the mouse or the owl perches with the mouse for at least one hour and gives no sign of further activity. Do not feed any more mice than necessary to determine pair status, nest location, and/or reproductive status (i.e., if all observed juveniles have received a mouse then number of young produced is determined and there is no need to continue mousing). Dropped mice or mice whose fates are unknown do not count toward the total of four mice needed to complete the protocol.

Ancillary notes on an owl's behavior during the mousing attempts are also very important to record. These observations can help clarify situations in which incomplete information was collected. For example, if a male is given a mouse and begins to make single-note contact calls while looking in a specific direction in April-June, that is often a good clue that a mate, nest, and/or young may be present. Sometimes observers are too close to other owls or the nest for the "true" mouse fate to be observed. Such observations should trigger another daytime follow-up to secure the location of a mate, nest, or young of the year. For these types of additional follow-up surveys, nighttime calling is usually not necessary.

7. Determining Status from Nighttime Surveys and Daytime Follow-up Visits

A. "Pair status" is established by any of the following:

1. A male and female owl are heard and/or observed in proximity (500 meters or 0.31 mile apart) to each other on the same visit.
2. A male takes a mouse to a female (see section 6 mousing guidelines).
3. A female is observed or heard on a nest.
4. One or both adults are observed with young.
5. At least one young of the year is observed.

B. "Single status" is inferred from:

1. A daytime observation on a single occasion or nighttime responses of a single owl within the same general area (within 500 meters or 0.31 mile) on two or more occasions, with no response by an owl of the opposite sex after two complete inventories (two years of survey); or

2. Multiple responses over several years from a bird of the same sex (i.e., two responses in first year of surveys and one response in the second year of surveys, from the same general area).

Determining if the responses occur within the same general area should be based on topography and the location of any other known owls in the surrounding area.

C. "Two birds, pair status unknown" is inferred from:

The presence or response of two owls of the opposite sex where pair status cannot be determined.

D. "Status unknown" is inferred by:

The response of a male and/or female spotted owl that does not meet any of the above criteria. We recommend additional years of survey if this is the site status following a complete inventory of the site.

E. "Absence" is inferred:

If a complete inventory has been conducted according to this protocol, or an alternative protocol approved by the FWS, and no owls are heard. However, absence does not necessarily indicate that owls never occupy the area.

F. Separate territories are inferred by:

When two responses are recorded from owls that are more than 800 meters (0.5 mile) apart. These responses should be considered from individuals in separate territories unless daytime follow-up visits indicate otherwise. Ideally, surveyors on two or more crews should coordinate efforts to begin calling simultaneously near each suspected activity area to rule out the existence of multiple territories. If more than one survey crew elicits responses from owls of the same sex at roughly the same time, then two or more territories probably exist. However, if responses vary from those above, the results are considered inconclusive and additional attempts to determine status should continue. Keep in mind that some spotted owls shift their use of an area after failing to nest in a given season. Hence, responses heard in July that are 800 meters (0.5 mile) from a pair that was nesting in April or early May could be from the same individuals.

8. Determining Nesting Status and Reproductive Success

Determining reproductive success is not required if breeding season restrictions that protect owl reproduction are applied to all management projects in any given year. However, reproduction surveys are always valuable as they can provide information on nest tree locations, which provide the best data for determining 100-acre **core areas** (Ward and Salas 2000) and delineating PAC boundaries as recommended in the revised Recovery Plan. If the exact location of the nest is not determined, but juveniles are seen prior to August, the area where the juveniles are seen can be referenced as the **nest stand**. There are two stages of reproduction surveys: nesting status and reproductive success.

A. Determining Nesting Status:

1. Nesting-status surveys should be conducted between 1 April and 1 June. The start date is based on nesting initiation dates. Young identified after 1 June would still confirm that nesting occurred but would not allow identification of the exact location of the nest. However, young observed prior to August are usually within 400 meters (0.2 miles) of the nest of that year (Ward and Salas 2000) and this information can be useful in delineating a 100-acre nest buffer.

2. Mousing should be used to determine nesting status. The site is classified as nesting, non-nesting, or unknown nesting status based on the surveyor's observations.

3. Two observations at least one week apart are necessary to determine nesting status if the first observation occurs before 1 May. This is necessary because the owls may show signs of initiating nesting early in the season without actually laying eggs and their behavior could be mistaken for nesting behavior. After 1 May, a single observation of nesting behavior is sufficient.

4. The owls are classified as nesting if, on two visits prior to 1 May, or one visit after 1 May:

   a. The female is seen on the nest;

   b. Either the male or female member of a pair carries a mouse to a nest; or

   c. Young-of-the-year are detected.

5. The owls will be classified as non-nesting if any of the following behaviors are observed. Two observations, minimum three weeks apart, are required during the nest survey period (1 April - 1 June) in order to infer non-nesting status. Because nesting attempts might fail before surveys are conducted, the non-nesting status includes owls that did not attempt to nest as well as those that had a failed nesting attempt. Non-nesting status is inferred during a daytime follow-up visit if:

   a. The female is observed roosting for a full 60 minutes (1-30 April) during the time she should be on a nest. The female should not be in an agitated state and should be given every opportunity to return to the nest. Surveyors should attempt to mouse the female.
   b. The surveyor offers prey to one or both members of the pair and they cache the prey, sit with the prey for an extended period of time (30-60 minutes), or refuse to take additional prey beyond the minimum of two prey items. To be considered a valid nesting survey, one owl must take <u>at least</u> two prey items.

   c. All pairs considered to be non-nesting should receive at least one daytime follow-up visit between 15 May and 15 July to confirm that no young were produced.

6. Nesting status is unknown if:

    a. Owls are found after 1 June without young-of-the-year; or

    b. No adult or young owls are found after 1 June at those sites where adult owls were present prior to 1 June.

B. Determining Reproductive Status:

1. Once a pair is classified as nesting, reproductive success surveys should be conducted after the time the young-of-the-year leave the nest (fledge), usually in early to mid-June. For pairs whose nesting status was not determined, reproductive success surveys should be conducted between 15 May and 15 July.

2. At least two visits to the site spaced at least one week apart should be conducted to locate and count fledged young, and the timing of the visits should be scheduled so that the fledged young are observed as soon after leaving the nest as possible.

3. Visual searches and/or mousing should be used to determine reproductive success. The mousing protocol is the same as for determining non-nesting. If young are present, the adults should take at least some of the prey to the young. The sight of an adult with prey can stimulate the young to beg, revealing their number and location.

4. If the owls take at least two prey items and eventually cache, sit with, or refuse further prey without ever taking prey to fledged young during the proper time period and no other indicative behaviors like contact calls or searching are observed, then zero young are recorded. If one individual adult or subadult owl takes and eats four mice on one visit during the proper time period, then zero young are recorded. If, however, other behaviors indicate young may be in the area, another follow-up survey is recommended to verify that zero young were produced, particularly if the pair had been observed nesting earlier that year.

9. Annual Reporting

An annual report of the activities conducted (including field data forms, if appropriate) should be submitted to the FWS Permits Office in Albuquerque, New Mexico, as well as the appropriate state FWS ESFO. If applicable, hard copies of any unpublished or published reports generated by the study and other data that would be useful for the conservation or recovery of the owl should be submitted to the appropriate FWS ESFO(s).

10. Disposition of Dead, Injured, or Sick Mexican Spotted Owls

Upon locating a dead, injured, or sick owl, initial notification should be made to the FWS's Law Enforcement Office in Arizona (telephone: 480-967-7900), Colorado (telephone: 303-274-3560), New Mexico (telephone: 505-346-7828), or Utah (telephone: 801-625-5570) within two working days (48 hours) of its finding. Written notification should be made within five calendar days and

should include information on when (date, time) and where (exact location) the owl was found, photographs of the owl and/or area, if possible, and any other pertinent information. The notification should be sent to the Law Enforcement Office with a copy to the appropriate FWS ESFO. Sick and injured owls should be transported by an authorized biologist to a licensed and permitted wildlife rehabilitator or veterinarian, and care must be taken during handling to ensure effective treatment. Should the treated owl(s) survive, the FWS should be contacted regarding the final disposition of the animal. Salvaged specimens or owls that did not survive rehabilitation should be handled with care to preserve the biological material, and the remains of intact owl(s) should be provided to the appropriate FWS ESFO (as noted in the Section 10 permit). If the remains of the owl(s) are not intact or are not collected, the information noted above should be obtained.

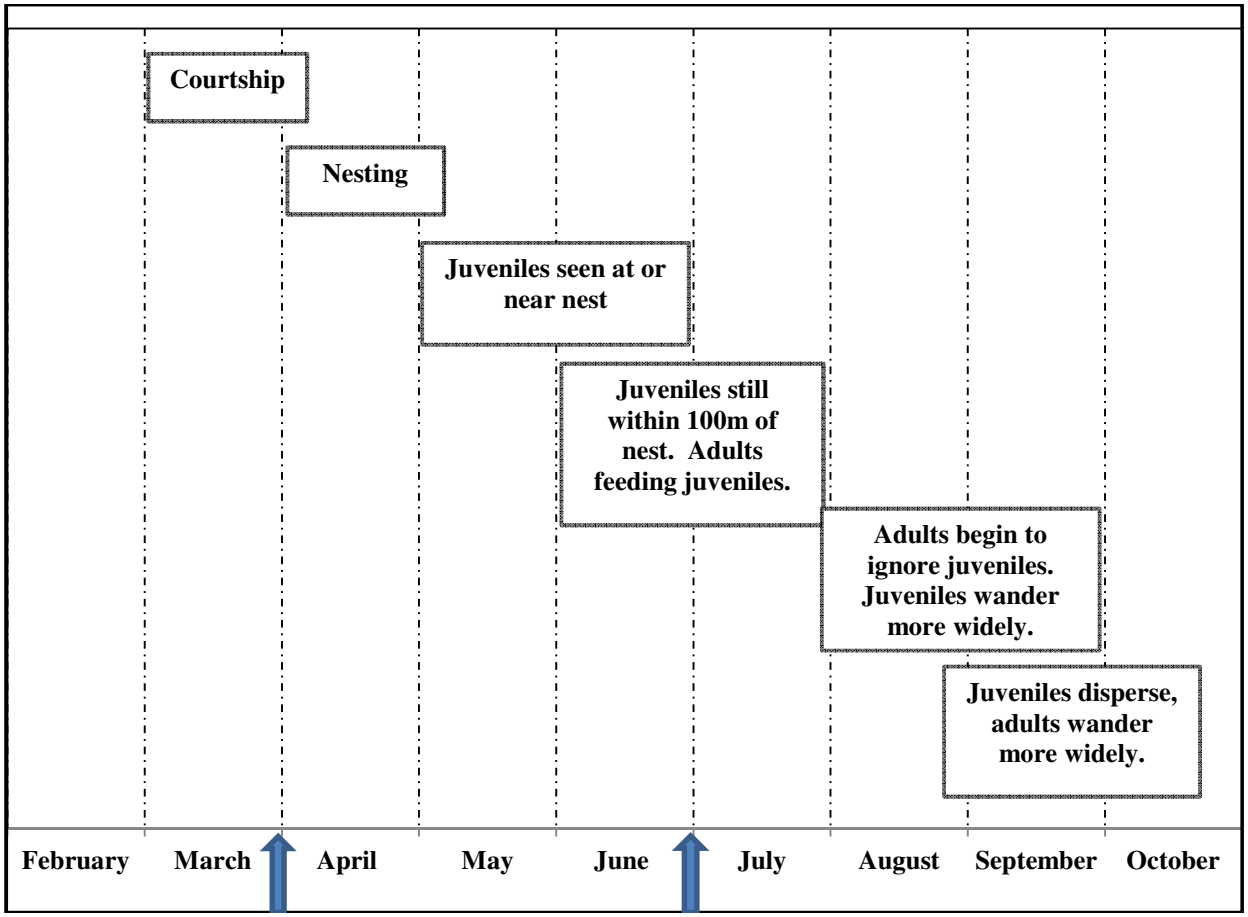

Figure D.1. Generalized reproductive chronology for the Mexican spotted owl. The area between the arrows at the bottom of the table indicates periods of high probability of detecting owls. Chronology may vary slightly with area, elevation, and/or in response to weather.

GLOSSARY FOR APPENDIX D, SURVEY PROTOCOL

Absence	Absence of Mexican spotted owls can be inferred when no response is recorded after a complete inventory has been completed in a defined area. Absence does not necessarily indicate that Mexican spotted owls do not or never occupy the area.
Adult	A Mexican spotted owl ≥3 years old. Tips of retrices (tail feathers) will be rounded with white and mottled color. Subadults will have triangular all white tips on tail feathers. For more information on identifying adult and first and second-year subadult Mexican spotted owls, see Moen et al. (1991).
Breeding Season	The time period from 1 March through 31 August that includes courtship, nesting, and nestling- and fledgling-dependency periods. **This is the period of time in which surveys should be conducted.** This time period will vary by geographic locale.
Calling Route	An established route within a survey area where vocal imitations or recorded calls of Mexican spotted owls are used to elicit a response.
Calling Stations	Point locations used to conduct surveys, distributed throughout an area so as to attain complete coverage of the survey area.
Complete Coverage	Complete coverage is obtained when the calling stations have been located within a survey area so that a Mexican spotted owl anywhere in the survey area would be able to hear surveyors and vice-versa.
Complete Inventory	When the following are met: 1) four complete surveys have been conducted in one year; 2) consecutive surveys have been conducted a minimum of five days apart; 3) no more than one survey has been conducted in March; 4) a minimum of two surveys have been conducted by 30 June; 5) all surveys were completed by 31 August, with no more than one survey conducted in the months of July and August; and, 6) two years of survey have been completed.
Complete Survey	A survey is complete when all calling stations or calling routes within a survey area are called within a seven-day period, including daytime follow-up visits for all Mexican spotted owl responses. If every reasonable effort has been made to cover the survey area in one outing but this is not accomplished, then additional outings will be scheduled to cover the remaining area. The entire survey area must be covered within seven consecutive days in order to be considered one complete survey. Although adverse weather conditions may present problems, an effort should be made to complete survey visits on consecutive days. If the survey area is too large to be completely surveyed in seven days, it may be

	divided into smaller areas based on available habitat, topography, drainages, etc.
Core Area	A 40-ha (100-acre) area within designated protected activity centers (PACs) circumscribed around the nest site. The nest area should include habitat that resembles the structural and floristic characteristics of the nest site. These 100-acre areas will be deferred from mechanical treatment. For additional details on delineation, see Ward and Salas (2000).
Daytime Follow-up Visit	A daytime follow-up visit is conducted around Mexican spotted owl responses. The objective of a daytime follow-up visit is to locate Mexican spotted owl(s), their nests and their young by conducting an intensive search within an 800-meter (0.5-mile) radius of the original nighttime or last known response location. The follow-up visit is conducted during daylight hours and should be completed as soon as possible following the initial detection, but no later than 48 hours after detection. If Mexican spotted owls are located during the daytime follow-up visit, the surveyors use the mousing technique to determine nesting and reproductive status.
Intermediate Calling Stations	Calling locations between identified calling stations or routes used to triangulate a Mexican spotted owl's location or used to improve calling coverage of an area when weather or other conditions require. These stations are not required to be established prior to the field outing in which they are used.
Juvenile	A Mexican spotted owl is considered a juvenile in its first five months after hatching. Juveniles one to three months old are very white and have downy plumage over all of the body or evident on breast and head; at four to five months old, juveniles begin losing downy plumage but retain white triangular tips on their tail feathers (Moen et al. 1991).
Mousing	Mousing is a term used to describe the act of offering prey items to owls or other birds of prey. The purpose of mousing Mexican spotted owls is to find mates and determine the reproductive status of the owl(s) (i.e., pair, nesting, non-nesting). In some instances, a male Mexican spotted owl will take a prey item to an unseen female or an adult owl will take prey items to unseen young.
Nest	Mexican spotted owls use broken-topped trees, old raptor nests, witches brooms, caves, cliff ledges, and tree cavities for nests. A Mexican spotted owl must be observed using the structure in order to designate a nest site.
Nest Stand	An area of vegetation that contains a Mexican spotted owl nest.

Nestling	A young owl that is still in the nest; may also be called a hatchling.
Predator	Potential predators of Mexican spotted owl eggs and young include the following: great-horned owl (*Bubo virginianus*), northern goshawk (*Accipiter gentilis*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), common ravens (*Corvus corax*) and procyonid mammals (e.g., coati [*Nasua nasua*] and ringtail [*Bassariscus astutus*]).
Protected Activity Center (PAC)	An area of at least 243 ha (600 acres) surrounding the "activity center," which is the nest site, a roost grove commonly used during the breeding season in absence of a verified nest site, or the best roosting/nesting habitat if both nesting and roosting information are lacking. The 243 ha (600 acres) (minimum size) is delineated around the activity center using boundaries of known habitat polygons and/or topographic boundaries, such as ridgelines, as appropriate. The boundary should enclose the best possible Mexican spotted owl habitat, configured into as compact a unit as possible, with the nest or activity center located near the center. This should include as much roost/nest habitat as is reasonable, supplemented by foraging habitat where appropriate. For example, in a canyon containing mixed-conifer on north-facing slopes and ponderosa pine on south-facing slopes, it may be more desirable to include some of the south-facing slopes as foraging habitat than to attempt to include 600 acres of north-slope habitat. In many canyon situations, oval PACs may make more sense than, for example, circular PACs; but oval PACs could still include opposing canyon slopes as described above. All PACs should be retained until this subspecies is delisted, even if Mexican spotted owls are not located there in subsequent years.
Remote Area	Generally, any survey area that requires more than four hours of travel time by vehicle and/or foot during good road, trail, and weather conditions (good for the road or trail in question) to reach. All remote areas should be agreed upon by the FWS on a case-by-case basis prior to using the survey protocol to clear a project.
Recovery Habitat	Mixed-conifer and pine-oak forest types, and riparian forests as described in this revised Recovery Plan. Recovery nest/roost habitat either is currently or has the potential to develop into nest/roost habitat. Recovery foraging/non-breeding habitat currently does or could provide habitat for foraging, dispersing, or wintering life history needs. Specific guidelines for management activities and developing recovery nest/roost conditions are specified in this revised Recovery Plan.

Roost	Tree, cliff ledge, rock, or log used by a Mexican spotted owl for extended daytime rest periods. A roost site consists of the roost itself and the immediate vicinity. Roost areas are identified by observations of the Mexican spotted owls and/or the presence of pellets, whitewash, and other evidence.
Subadult	Mexican spotted owls in their second and third summers. Identified by characteristic tail feathers with white tips tapering to sharp points (i.e., triangular shaped). For more information on identifying subadult Mexican spotted owls, please see Moen et al. (1991).

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Mexican Spotted Owl Survey Protocol Outline

Complete Inventory Four complete surveys each year (minimum five days apart)
No more than one survey in March
Minimum of two surveys prior to June 30th
No more than one survey in each of July and August
All surveys completed by 31 August
Two years of complete surveys

1. Owl(s) Detected, go to 3

2. No Owls Detected, Absence inferred for survey area

3. PRESENCE - Conduct a daytime follow-up visit

   A. No owl(s) found on daytime follow-up visit:

      Status unknown, SINGLE STATUS inferred, return to night calling

   B. Single owl located on daytime follow-up visit:

      Feed maximum 4 mice to owl to determine status; if no other owl located, RESIDENT SINGLE CONFIRMED

   C. Pair of owls located on daytime follow-up visit:

      PAIR CONFIRMED for site, go to 4B

4. NESTING STATUS SURVEYS (1 April - 1 June)

   A. Pair not detected, non-nesting, non-reproduction inferred (for that survey)

   B. Pair located, mouse owls (1 of owl pair fed 4 mice)

      1. If one of the following occurs, nesting confirmed, reproduction unknown, go to 5B:

         a. Female on nest

         b. Owl takes prey to nest

         c. Young in nest with adult present

      2. If one of the following occurs, non-nesting inferred, non reproduction inferred (two visits to infer non-nesting, minimum three weeks apart):

a. One of owl pair fed four mice (know fate of all four mice)

b. Female refuses mouse and/or roosts for minimum one hour (1 April - 30 April)

3. Pair (but no young) located after 1 June:

a. NESTING STATUS UNKNOWN

b. Conduct reproductive visit, go to 5A

5. REPRODUCTIVE SUCCESS VISITS

A. NESTING STATUS UNKNOWN

1. Recommend two visits, one week apart, feed four mice to locate juveniles

B. NESTING STATUS KNOWN

1. One visit to look for juveniles (this may take more than one visit to locate all juveniles produced)

2. If surveyor does not find juveniles, mouse adults to locate juveniles

Attachments 2-6

Site Occupancy by Mexican Spotted Owls (*Strix occidentalis lucida*) in the US Forest Service Southwestern Region, 2014

30 March 2015

Rocky Mountain Bird Observatory
14500 Lark Bunting Lane
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Technical Report #SC-MSO-USFS-01

ROCKY MOUNTAIN BIRD OBSERVATORY

Mission: *To conserve birds and their habitats*

Vision: *Native bird populations are sustained in healthy ecosystems*

Core Values:
1. ***Science*** *provides the foundation for effective bird conservation.*
2. ***Education*** *is critical to the success of bird conservation.*
3. ***Stewardship*** *of birds and their habitats is a shared responsibility.*

RMBO accomplishes its mission by:

- ***Monitoring*** *long-term bird population trends to provide a scientific foundation for conservation action.*
- ***Researching*** *bird ecology and population response to anthropogenic and natural processes to evaluate and adjust management and conservation strategies using the best available science.*
- ***Educating*** *people of all ages through active, experiential programs that create an awareness and appreciation for birds.*
- ***Fostering*** *good stewardship on private and public lands through voluntary, cooperative partnerships that create win-win situations for wildlife and people.*
- ***Partnering*** *with state and federal natural resource agencies, private citizens, schools, universities and other non-governmental organizations to build synergy and consensus for bird conservation.*
- ***Sharing*** *the latest information on bird populations, land management and conservation practices to create informed publics.*
- ***Delivering*** *bird conservation at biologically relevant scales by working across political and jurisdictional boundaries in western North America.*

Suggested Citation:
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Cover Photo:
Mexican Spotted Owl by Danny Hofstadter. Used with permission.

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EXECUTIVE SUMMARY

The Mexican Spotted Owl (MSO) was listed as threatened under the Endangered Species Act in 1993. A revised recovery plan for MSO was completed in 2012, recommending that the population be monitored via estimating the rate of site occupancy. In August 2013, the US Forest Service Southwestern Region contracted with Rocky Mountain Bird Observatory (RMBO) to refine the site occupancy monitoring protocol recommend in the revised recovery plan, and to pilot test the protocol on Forest Service lands in Arizona and New Mexico in 2014.

The first step in developing a protocol for monitoring site occupancy of MSO was to define a sampling frame so that survey effort would be focused in areas of potentially suitable MSO habitat. In consultation with the US Forest Service and US Fish and Wildlife service, I used two sources of data to identify areas containing potentially suitable habitat: (1) Potential vegetation cover types, based on US Forest Service Ecological Response Unit classifications, and (2) a geophysical model of potential MSO habitat developed by Terry Johnson using data from MSO locations in Arizona and New Mexico.

Within the sampling frame, I defined sampling units as 1-km^2 areas (sites), each containing 5 survey points. RMBO employees conducted broadcast surveys at the survey points to locate Spotted Owls within the sampling units. We attempted to make two visits to each sampling unit between early April and mid-July 2014. We successfully surveyed 276 sampling units at least once, with 139 of those sampling units receiving two surveys each.

Using the resulting broadcast survey data, I estimated detection probability ($p = 0.725$; $SE(p) = 0.053$) and the probability of site occupancy ($Psi = 0.378$; $SE(Psi) = 0.038$) with Program MARK. I also used Program MARK to simulate the number of sampling units needed to estimate MSO site occupancy rates with sufficient precision to meet the guidelines of MSO monitoring as outlined in the 2012 MSO Recovery Plan. Simulation results based on a single year of data suggest that surveying 150 sampling units two times each year would be sufficient for monitoring the MSO population trend. Because we do not yet know the annual variation in detection probability nor site occupancy rates, I recommend that the US Forest Service survey 200 sampling units two times each year until we can evaluate more sophisticated simulation models that include annual variation.

In summary the sampling frame and survey methods used in 2014 provided the framework needed to continue to monitor site occupancy by Mexican Spotted Owls in the Southwestern Region of the US Forest Service. This framework may be expanded or adapted for monitoring Mexican Spotted Owls in additional areas of their range.

Site Occupancy by Mexican Spotted Owls (*Strix occidentalis lucida*) in the US Forest Service Southwestern Region, 2015

16 November 2015

Bird Conservancy of the Rockies

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Technical Report SC-MSO-USFS-02

The Bird Conservancy of the Rockies

Connecting people, birds and land

Mission: Conserving birds and their habitats through science, education and land stewardship

Vision: Native bird populations are sustained in healthy ecosystems

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4. Promote conservation and inform land management decisions by disseminating scientific knowledge and developing tools and recommendations.

Suggested Citation:

Lanier, W. E. and J. A. Blakesley. 2015. Site Occupancy by Mexican Spotted Owls (*Strix occidentalis lucida*) in the US Forest Service Southwestern Region, 2015. Bird Conservancy of the Rockies. Brighton, Colorado, USA.

Cover Photo:

Mexican Spotted Owl by Danny Hofstadter. Used with permission.

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Executive Summary

The Mexican Spotted Owl (MSO) was listed as threatened under the Endangered Species Act in 1993. A revised recovery plan for MSO was completed in 2012, recommending that the population be monitored via estimating the rate of site occupancy. In August 2013, the US Forest Service Southwestern Region contracted with the Bird Conservancy of the Rockies (formerly the Rocky Mountain Bird Observatory) to refine the site occupancy monitoring protocol recommended in the revised recovery plan, to pilot test the protocol in 2014, and continue monitoring in subsequent seasons on Forest Service lands in Arizona and New Mexico.

We surveyed 201 sites at least twice in 2015. These sites were a random subset of sites surveyed in 2014.

We analyzed the data in a Multistate Robust Design framework. This analysis method not only allows for estimation of site occupancy for separate states (in our case: unoccupied, occupied by a single owl, or occupied by a pair) but it also estimates the transition probabilities between those states. Using this model we were able to estimate the site occupancies for the three states in 2014 and 2015 and the transition probabilities that describe colonization events. In the future, this framework will be useful to understand the habitat and environmental covariates that cause variation in local colonization and extinction probabilities.

The probability that a pair occupied a site was higher in 2015 than in 2014 indicating a positive trend in the population in the last year. Similarly, the probability that a site was unoccupied decreased from 2014 to 2015.

The estimates of the transition probabilities provided insight about the occupancy dynamics in the region. Our analysis also showed that there was very little downgrading in occupancy status (i.e. transition from being occupied by a pair or single owl in 2014 to being unoccupied in 2015). One of the more interesting findings from the estimates of the transition probabilities was that a site that was not occupied by a pair in 2014 was more likely to be occupied by a pair in 2015 if the site was occupied by a single owl in 2014, than if it was unoccupied in 2014. It appeared that site occupancy by a single owl can serve as a "stepping stone" to site occupancy by a pair.

In summary the sampling frame and survey methods used in 2014 provided the framework needed to continue to monitor site occupancy by Mexican Spotted Owls in the Southwestern Region of the US Forest Service in 2015. This framework may be expanded or adapted for monitoring Mexican Spotted Owls in additional areas of their range. Additional seasons of data collection will allow us to expand the analysis to answer pertinent questions about what factors drive the occupancy dynamics.

Site Occupancy by Mexican Spotted Owls (*Strix occidentalis lucida*) in the US Forest Service Southwestern Region, 2016

27 October 2016

Bird Conservancy of the Rockies

Connecting People, Birds and Land

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Technical Report SC-MSO-USFS-03

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Cover Photo:

Mexican Spotted Owl Pair in Ponderosa Pine Near Flagstaff, AZ by Wendy Lanier

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As part of this continued monitoring, we surveyed 200 sites in 2016. These sites were a random subset of sites initially surveyed in 2014 and the same sites surveyed in 2015.

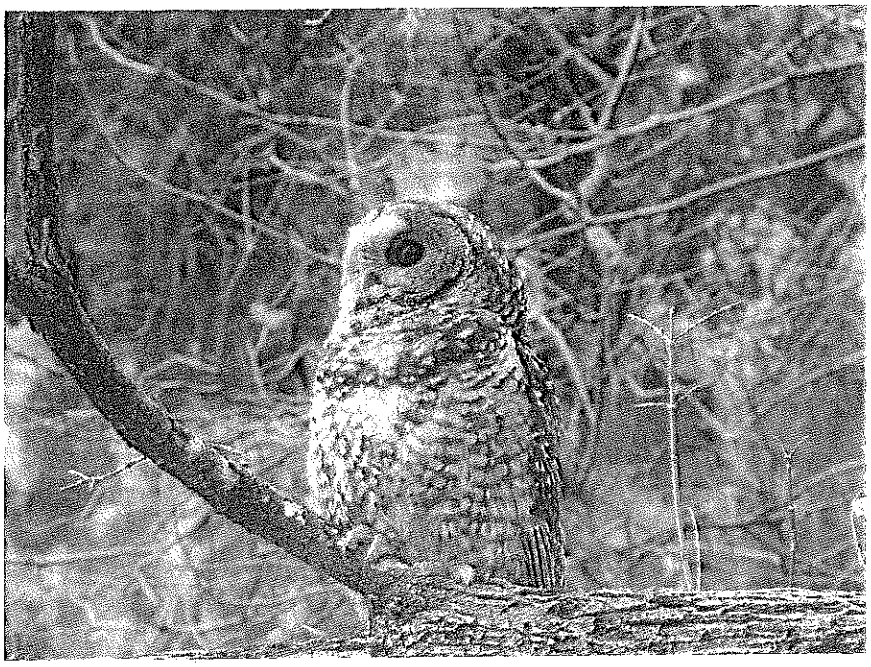
We analyzed the data using single species multistate and multistate robust design occupancy modeling frameworks. Using these models we were able to estimate the site occupancy probabilities for the three occupancy states (i.e., unoccupied, occupied by a single owl, or occupied by a pair) in 2014, 2015, and 2016 as well as the overall occupancy of the study area. In addition, we were able to estimate transition probabilities that describe colonization and local extinction events that result in changes in occupancy of sites. In the future, this framework will be useful to understand the climatic and environmental covariates that cause variation in local colonization and extinction probabilities.

The probabilities for general occupancy and occupancy by pairs of Mexican Spotted Owls show a positive trend. Both increased from 2014 to 2015 then held stable from 2015 to 2016. This was reflected in the estimated state transition probabilities between these three years.

These models also account for imperfect detection. Detection probability was influenced by the factors of ordinal data, wind, and noise level. Unsurprisingly, wind and noise had a negative impact on detection probability. Detection improved as the season progressed either from different behavioral responses of the owls during different periods of the breeding season or because of increasing technician ability. We also found that detection probability was higher for pairs than for single owls.

In summary the sampling frame and survey methods used in 2014 provided the framework needed to continue to monitor site occupancy by Mexican Spotted Owls in the Southwestern Region of the US Forest Service in 2015 and 2016. This framework may be expanded or adapted for monitoring Mexican Spotted Owls in additional areas of their range. Additional years of data collection will allow us to expand the analysis to answer pertinent questions about what factors drive the occupancy dynamics which will inform management of this sensitive species.

Site Occupancy by Mexican Spotted Owls (*Strix occidentalis lucida*) in the US Forest Service Southwestern Region, 2017



December 2017

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Mexican Spotted Owl by Shaula Hedwall. Used with permission.

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As part of this continued monitoring, we surveyed 200 sites in 2017. These sites were a random subset of sites initially surveyed in 2014 and the same sites surveyed in 2015 and 2016.

We analyzed the data under a multistate occupancy modeling framework. Using this model we were able to estimate the site occupancy probabilities for MSO in 2014-2017 as well as the probability that an occupied site contained a pair of MSOs. The probabilities for occupancy and conditional occupancy by pairs of Mexican Spotted Owls show similar trends. Both increased from 2014 to 2015 then held stable from 2015 to 2017.

These models also account for imperfect detection. Detection probability was influenced by ordinal data, wind, and noise levels. Unsurprisingly, wind and noise had a negative impact on detection probability. Detection improved as the season progressed either from different behavioral responses of the owls during different periods of the breeding season or because of improving survey skill of the technicians. We also found that detection probability was higher for pairs than for single owls.

In summary, the sampling frame and survey methods used in 2014 provided the framework needed to continue to monitor site occupancy by Mexican Spotted Owls in the Southwestern Region of the US Forest Service in 2015-2017. This framework may be expanded or adapted for monitoring Mexican Spotted Owls in additional areas of their range. Additional years of data collection will allow us to expand the analysis to answer pertinent questions about what factors drive the occupancy dynamics which will inform management of this sensitive species.

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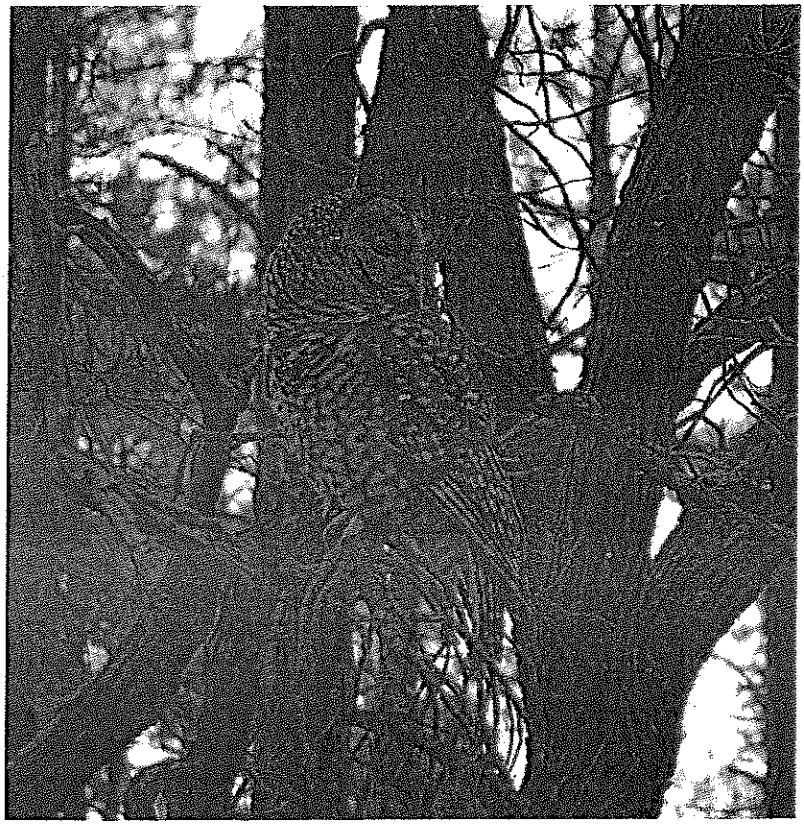

October 2018

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As part of this continued monitoring, we surveyed 198 sites in 2018. These sites were a random subset of sites initially surveyed in 2014 and the same sites surveyed in 2015-2017, except for two sites which were inaccessible due to fire. Of the 198 sites, 163 were surveyed twice. Forest fires and fire-related National Forest closures prohibited us from completing second surveys in 35 sites. However, our data were still sufficient to estimate occupancy and detection probabilities.

We analyzed the data under a multistate occupancy modeling framework. Using this model we were able to estimate the site occupancy probabilities for MSO in 2014-2018 as well as the probability that an occupied site contained a pair of MSOs. The probability of site occupancy increased from 2014 to 2016 and decreased from 2016 to 2018. The conditional probability that an occupied site contained a pair of MSOs remained constant across years.

These models also account for imperfect detection. Detection probability was influenced by ordinal date and wind levels. Unsurprisingly, wind had a negative impact on detection probability. Detection improved as the season progressed in sites with pairs of owls. This is likely due to different behavioral responses of the owls during different stages of the breeding season. We also found that detection probability was higher for pairs than for single owls.

In summary, the sampling frame and survey methods used in 2014 provided the framework needed to continue to monitor site occupancy by Mexican Spotted Owls in the Southwestern Region of the US Forest Service in 2015-2018. This framework may be expanded or adapted for monitoring Mexican Spotted Owls in additional areas of their range. Additional years of data collection will allow us to expand the analysis to answer pertinent questions about what factors drive the occupancy dynamics which will inform management of this sensitive species.

Attachment 7

United States
Department of
Agriculture

Forest
Service

Southwestern
Region

July 1985

Cibola National Forest Land and Resource Management Plan

5. Monitoring Plan

INTRODUCTION

The purpose of monitoring and evaluating the implementation of the Forest Plan is to inform the decision maker of the progress toward achieving the goals, objectives, and standards and guidelines.

Monitoring will determine:

- if the management prescriptions are applied as directed.
- if standards are being followed.
- if the Forest is achieving the objectives of the Forest Plan.
- if the application of management prescriptions is responding to public issues and management concerns.
- if the effects of implementing the Forest Plan are occurring as predicted.
- if the costs of implementing the Forest Plan are as predicted and are acceptable.
- if management practices on adjacent or intermingled non-Forest lands are affecting the Forest Plan goals and objectives.

A detailed annual monitoring action plan will be prepared. This annual monitoring action plan will include the details on the amount and location of monitoring to be accomplished. Specific locations, intensity of sampling, person-days required, and costs will be identified in the annual monitoring action plan. The activities to be monitored will be selected from the list in the rest of this chapter.

Evaluation of the results of the site-specific annual monitoring action plan will be documented in the annual evaluation report. The significance of the results of the monitoring action plan will be analyzed and evaluated by the Forest interdisciplinary team.

Based on the evaluation, any need for further action is recommended to the Forest Supervisor. The recommendations can include:

- no action needed. Monitoring indicates goals, objectives, and standards are being reasonably achieved;
- refer recommended action to the appropriate line officer for improvement of application of management prescriptions;
- modify the management prescription as a Forest Plan amendment;
- modify the assignment of a prescription as a Forest Plan amendment;
- revise the projected schedule of outputs; or
- initiate revision of the Forest Plan.

The documented file of the Forest Supervisor's decisions resulting from monitoring and evaluation is maintained for future use in amending or revising the Forest Plan. An annual evaluation report of these decisions will be prepared and sent to the Regional Forester for his consideration.

The Forest Plan's monitoring requirements follow. For each activity, practice, or effect to be monitored, one or more measurement techniques and the expected future condition to be met are specified. A frequency for measuring and reporting the monitored item is established, and the expected precision and reliability of that

7. TIME FOR REPORTING:

3rd, 5th and 9th year.

8. COST:

$200 per report

9. EVALUATION:

Compare actual use recorded for a 3-year time period to projected use for each wilderness. If use exceeds 30 percent of the projected use or if use exceeds capabilities of the wilderness resources by 30 percent, ID Team will evaluate and Plan modification may be necessary.

WILDERNESS 2

1. ITEM MONITORED:

Miles of wilderness trail construction/reconstruction and maintenance.

2. PURPOSE:

Federal Regulations, measure prescriptions and effects. Forest issue related.

3. EXPECTED FUTURE CONDITION:

Wilderness use is expected to be less than capacity at the end of Period 5 on a Forest-wide basis, with the exception of the Sandia Mountain Wilderness. An improved trail system through construction/reconstruction and maintenance is expected to provide a better distribution of visitor use and improve wilderness opportunities.

4. MONITORING METHOD:

Work Accomplishment Reports.

5. FREQUENCY:

Annually

6. EXPECTED PRECISION/RELIABILITY:

±5%/±5%

7. TIME FOR REPORTING:

3rd, 6th and 9th years

8. COST:

$200 per report

9. EVALUATION:

Evaluation by the ID Team will be made at the third and sixth years during the decade to insure that cumulative deviation for the decade does not vary by ±25%. Plan modification may be necessary if ±25% is exceeded.

WILDLIFE 1/2

1. ITEM MONITORED:

Acres of browse vegetation associations treated to improve availability and productivity.

2. PURPOSE:

Improve habitat capability and productivity for all species, including indicator species.

3. EXPECTED FUTURE CONDITION:

Browse stands should be maintained in lower successional stages to provide optimum cover and forage availability.

4. MONITORING METHOD:

Review annual work accomplishment reports. - Supervisor's Office

Document pre and post-treatment utilizing standard vegetation analysis techniques. - Districts

5. FREQUENCY:

Every year as occurs

6. PRECISICION/RELIABILITY:

±10%/±20%

7. TIME FOR REPORTING:

3rd, 6th and 9th year

8. COST:

$1,000 annually per treatment, pre and post analysis

9. EVALUATION:

Evaluation by the ID Team will be made at the third, sixth, and ninth years during the decade to insure that cumulative deviation does not vary by ±20%. Plan modification may be necessary if ±20% is exceeded.

WILDLIFE 3

1. ITEM MONITORED:

Number of water developments.

2. PURPOSE:

Federal Regulation

3. EXPECTED FUTURE CONDITION:

Maintain or improve essential habitat of indicator and other species.

4. MONITORING METHOD:

Review annual work accomplishment reports.

5. FREQUENCY:

Every three years

6. EXPECTED PRECISION/RELIABILITY:

±5%/±10%

7. TIME FOR REPORTING:

3rd, 6th and 9th year

8. COST:

$100 per report

9. EVALUATION:

If water developments fall below numbers as indicated in the Plan by 20% at the end of the ninth year, the ID Team will evaluate and Plan modification may be necessary.

WILDLIFE 4

1. ITEM MONITORED:

Number of quality snags per acre.

2. PURPOSE:

Federal regulation

3. EXPECTED FUTURE CONDITION:

Maintain or improve essential habitat for indicator and other species.

4. MONITORING METHOD:

Field review of timber sale areas (on a sample basis).

5. FREQUENCY:

Every three years

6. EXPECTED PRECISION/RELIABILITY:

±20%/±20%

7. TIME FOR REPORTING:

3rd, 6th and 9th year

8. COST:

$100 per report

9. EVALUATION:

If estimated number of quality snags per acre fall below numbers as indicated in the Plan by 20% at the end of the ninth year, the ID Team will evaluate and Plan modification may be necessary.

WILDLIFE 5

1. ITEM MONITORED:

Number of roost groups.

2. PURPOSE:

Federal regulation

3. EXPECTED FUTURE CONDITION:

Maintain or improve essential habitat for indicator and other species.

4. MONITORING METHOD:

Field inspection of timber sale areas (on a sample basis).

5. FREQUENCY:

Every three years

6. EXPECTED PRECISION/RELIABILITY:

±20%/±20%

7. TIME FOR REPORTING:

3rd, 6th and 9th year

8. COST:

$700 each report

9. EVALUATION:

If estimated number of roost groups remaining in a timber sale area after harvest is less than the number of roost groups identified for the areas prior to harvest, the ID Team will evaluate and Plan modification may be necessary.

WILDLIFE 6

1. ITEM MONITORED:

Threatened or endangered animals.

2. PURPOSE:

Federal regulations

3. EXPECTED FUTURE CONDITION:

Maintain or improve habitat conditions to increase populations, and eventual downlisting to delisting.

4. MONITORING METHOD:

Christmas Audubon Bird Counts, contract, State supplied data, U.S. Fish and Wildlife Service supplied data.

5. FREQUENCY:

Annually for Federally listed species and when invited to participate by states for State listed species.

6. EXPECTED PRECISION/RELIABILITY:

±20%/±20%

7. TIME FOR REPORTING:

Annually for Federally listed species and as needed for State species.

8. COST:

$500 for Federally listed species.
$200 for State listed species.

9. EVALUATION:

Ultimate goal is to delist species. Time periods will vary according to individual recovery plans. Goals will be taken from them and the portion assigned to the Cibola will be applied.

WILDLIFE 7

1. ITEM MONITORED:

Threatened and endangered/sensitive plants.

2. PURPOSE:

Federal regulations and Regional Forester direction.

3. EXPECTED FUTURE CONDITION:

Maintain or improve habitat condition to increase population and eventually remove from list.

4. MONITORING METHOD:

Surveys by Forest Service personnel and contractors, and from data supplied by U.S. Fish and Wildlife Service and states.

5. FREQUENCY:

Bi-annual surveys unless habitat is threatened by resource management activities.

6. EXPECTED PRECISION/RELIABILITY:

±20%/±20%

7. TIME FOR REPORTING:

Within 3 months to one year of the surveys.

8. COST:

$700 per species.

9. EVALUATION:

Ultimate goal is to delist. Time periods will vary according to sensitivity and populations of individual species.

WILDLIFE 8

1. ITEM MONITORED:

Population and habitat trends of management indicator species.

2. PURPOSE:

Federal regulation.

3. EXPECTED FUTURE CONDITION:

Maintain or improve essential habitat conditions.

4. MONITORING METHOD:

A. Nongame Birds:

1. Point-counting method developed by Reynolds et al.
(Reynolds, R.T., J. M. Scott, and R. A. Nussabaum, 1980. A variable circular-pilot method for estimating bird numbers. Condor 82:309-313.)

2. Monitor Management guilds as developed by Short and Burnham, and modified by Verner.
(Short M. L., and K. P. Burnham. 1982. Technique for structuring wildlife guilds to evaluate impacts on wildlife communities. USDI Fish and Wildlife Service, Special Sci. Report-Wildlife 2244.33 pp.) (Verner, J. In press. The guild concept applies to management of bird populations. Environ. Manage.)

3. Single-season monitoring by Verner.
(Verner, J. 1980 a. Birds of California oak habitats-management implications. Pages 246-264 in T. T. Plumb, tech. coord. Proceedings of symposium on the ecology, management, and utilization of California oaks. USDA Forest Service, Gen. Tech. Report PSW-44. Pacific Southwest Forest and Range Exp. Sta., Berkeley, CA 368 pp. Verner J. 1980b. Bird communities of mixed conifer forests of the Sierra Nevada. Pages 198-223 in R. M. DeGraaf, tech. coord. Workshop proceedings: management of western forest and grasslands for nongame birds. USDA Forest Service, Gen. Tech. Report INT-86. Intermountain Forest and Range Exp. Sta., Ogden, UT.)

4. Monitor trends in habitat by Thomas et al.

(Thomas, J. W., R. J. Miller, C. Master, R. G. Anderson, and B. E. Carter. 1979. Plant communities and successional stages. Pages 22-39 in J. W. Thomas, tech. ed. Wildlife habitats on managed forests: the Blue Mountains of Oregon and Washington. Agric. Handbook No. 553 USDA Forest Service, Washington, DC 512 pp.)

B. Game Animals

1. Respective State Game and Fish census techniques and resultant data.

2. Monitor trends in habitat.`

5. FREQUENCY:

A. Nongame birds:

1. Monitor every two years, of management guilds of birds in habitat especially vulnerable to management actions.

2. Monitor other habitats and species using appropriate methods every five years.

3. Monitor trends in habitat diversity every five years.

4. Monitor compliance with Regional and Forest Standards and policies related to maintenance and/or improvements of nongame bird habitat annually.

B. Game animals

1. Analyze State Game and Fish data annually.

2. Monitor trends in habitat diversity every five years.

3. Monitor compliance with Regional and Forest standards and policies related to maintenance and/or improvements of game animal habitat annually.

6. EXPECTED PRECISION/RELIABILITY:

±20%/±20%

7. TIME FOR REPORTING:

A. Nongame birds:

1. Baseline data—Annually through year 5 of first period.

2. Monitor populations—Years 6, 8, 10 of first period.

3. Monitor habitat—Annually, years 1-10.

B. Game animals

1. Analyze State Game and Fish data annually.

2. Monitor habitat annually.

8. COST:

A. Baseline data collection and first 5 years of monitoring (years 1-5). The initial monitoring will be done in conjunction with baseline data collection. The effectiveness of monitoring is reduced until baseline data is collected.

1. Nongame birds—Estimated $8,000 annually.

2. Game animals--$500 annually.

B. Monitoring program (Years 5-10)

1. Nongame birds-$8,000 biannually (Years 5, 7, 9).

2. Game animals-$500 annually.

9. EVALUATION:

A. Nongame birds-Through monitoring of habitat and populations a determination will be made to ensure the species do not fall below minimum viable populations.

B. Game animals-With data furnished by the respective State Game and Fish agencies on population numbers, a determination will be made to ensure the species do not fall below minimum viable populations.

RANGE 1

1. ITEM MONITORED:

Acres of overstory modification in woodland type.

2. PURPOSE:

Federal regulation; measure prescription and effects.
Forest related issue.

3. EXPECTED FUTURE CONDITION:

Increase forage production in analysis areas where overstory modification is scheduled.

4. MONITORING METHOD:

Review of annual work accomplishment reports.

5. FREQUENCY:

Annually

6. EXPECTED PRECISION/RELIABILITY:

±10%/±20%

7. TIME FOR REPORTING:

5th and 9th year

8. COST:

$100 per report.

9. EVALUATION:

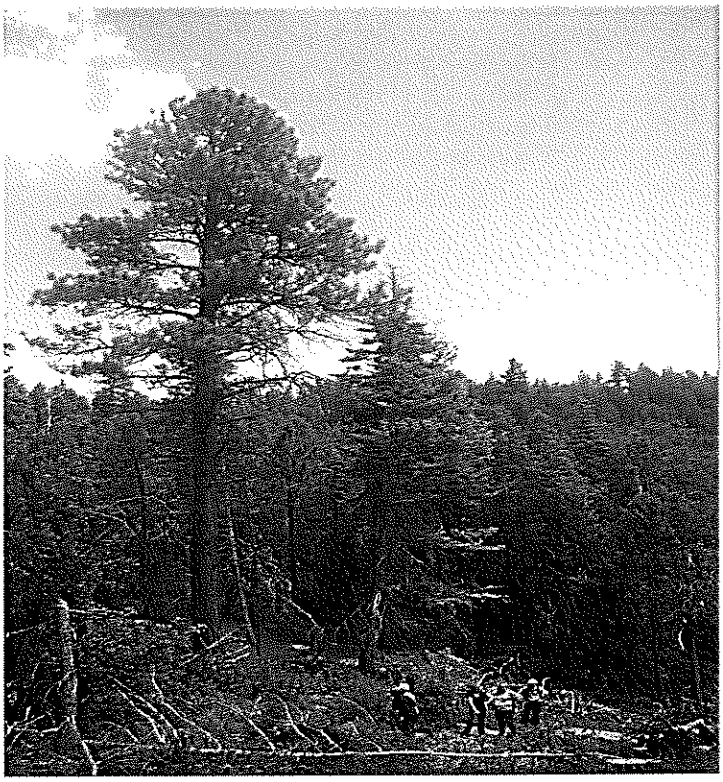
The acres of overstory modification completed for the evaluation period (ending at 9th year) should be within 10% of projection. If not, the ID Team will evaluate and Plan modification may be necessary.

Attachment 8

USDA
United States Department of Agriculture

Cibola National Forest and National Grasslands

Fiscal Year 2017 Monitoring and Evaluation Report



Forest Service Southwestern Region

August 2019

Executive Summary

This monitoring and evaluation report for fiscal year 2017 (FY 2017) gives monitoring results for land and resource management activities important to achieving Forestwide goals stated in the 1985 Cibola National Forest Land and Resource Management Plan (1985 Cibola Forest Plan) and grasslands-wide desired conditions stated in the 2012 Kiowa, Rita Blanca, Black Kettle and McClellan Creek National Grasslands Plan (2012 Cibola Grasslands Plan). The monitoring elements and questions addressed in this report are on pages 199–229 of the 1985 Cibola Forest Plan and pages 113–125 of the 2012 Cibola Grasslands Plan.

The following is a synopsis of information found in Table 3 and Table 4. Monitoring results, and inferences where appropriate, are presented for cultural resources, engineering, fire, forestry, lands and land use, minerals, range, recreation, soils and water, wildlife, vegetation conditions and ecological indicators, and wildlife management indicator species. These results and inferences are relevant to future adaptive management.

Elements Monitored and Results under the 1985 Cibola Forest Plan for the Mountain Ranger Districts

Cultural Resources

Cultural resources monitoring in FY 2017 involved 0 heritage resource sites, determined as eligible for the National Register. Archeologists conducted 13 surveys for section 106 clearances and documented 37 sites.

Engineering

No new roads were constructed, and 4 miles of existing system roads were reconstructed in FY 2017. Approximately 369 miles of Forest Service system roads were maintained Forest-wide, and 5.5 miles of roads were decommissioned. Overall, Forest road conditions continued to deteriorate. Reductions in funding have prevented adequate maintenance, road improvement, and road decommissioning.

Fire Monitoring

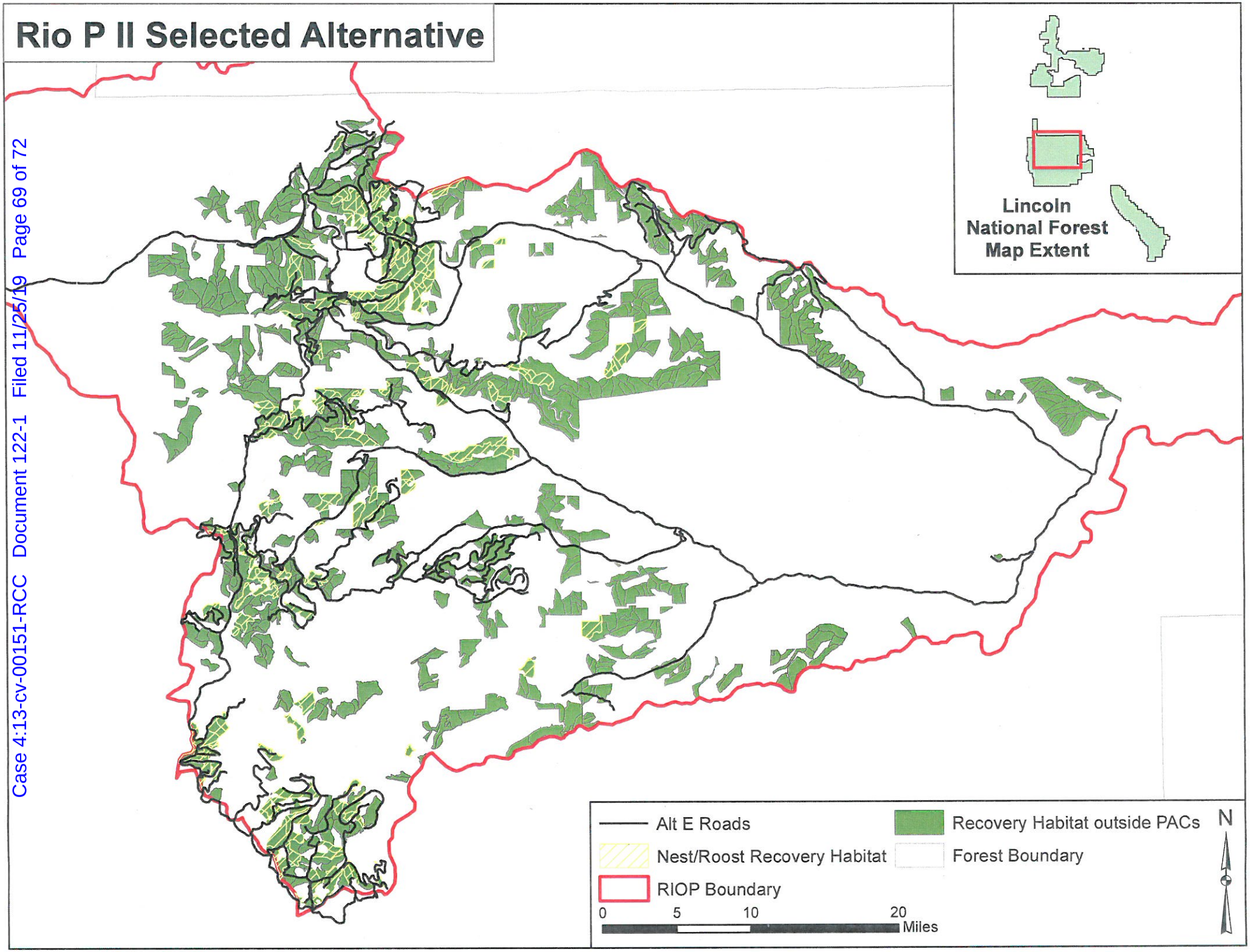
Fire and fuels staff conducted and monitored 4 prescribed burns on the Cibola National Forest totaling approximately 3,306 acres in FY 2017. 74 wildfires burned about 4,439 acres in FY 2017 on the Cibola NF & NG. A bulk of those acres was the Taylor Canyon Fire. The Magdalena Ranger District was able to capitalize on weather and fuel conditions and manage the Taylor Canyon Fire for resource benefit. The Red Canyon fire was an excellent example of fire managers returning fire to an ecosystem that was greatly departed from its natural range of variability. The fire burned in a mosaic pattern that met resource objectives across the board.

Forestry

Forestry staff monitored compliance with silvicultural prescriptions, including post-treatment basal areas, canopy cover, stand densities, snag retention, and implementation of mitigation measures in timber sale and personal-use firewood programs. Monitoring allowed District staff to make area wide designations for personal-use firewood in Magdalena Ranger District and to make length-of-season adjustments in personal-use firewood in Mount Taylor Ranger District, Magdalena Ranger District, and Mountainair Ranger District.

Attachment 9

Rio P II Selected Alternative



Attachment 10

USDA United States Department of Agriculture

Forest Service

Rocky Mountain Research Station

General Technical Report RMRS-GTR-86

February 2002

Using Terrestrial Ecosystem Survey Data to Identify Potential Habitat for the Mexican Spotted Owl on National Forest System Lands: A Pilot Study

Joseph L. Ganey and Mary Ann Benoit

Abstract

Ganey, Joseph L.; Benoit, Mary Ann. 2002. Using terrestrial ecosystem survey data to identify potential habitat for the Mexican spotted owl on National Forest System lands: a pilot study. Gen. Tech. Rep. RMRS-GTR-86. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 25 p.

We assessed the usefulness of Terrestrial Ecosystem Survey (TES) data as a means of identifying habitat for the Mexican spotted owl (*Strix occidentalis lucida*) in three National Forests in Arizona. This spatial data set incorporates information on soils, vegetation, and climatic conditions in defining a set of ecological "map units" showing potential vegetation. We used three separate data sets consisting of spotted owl locations resulting from: (1) U.S. Forest Service (USFS) surveys; (2) mark-recapture sampling of 12 randomly selected "quadrats" ranging from 40 to 76 km², conducted in conjunction with population monitoring efforts; and (3) monitoring of radiomarked owls in four study areas. For each data set and National Forest, we overlaid owl locations on geographical information system (GIS) coverages of TES map units and summarized data on relative use patterns. Using standardized criteria specific to each data set, we identified subsets of map units strongly associated with owl use based on that data set and assessed subset consistency among data sets. All data sets identified a subset of map units as associated with owl use. Most map units identified by quadrat or radiotelemetry data also were identified by the more extensive but less detailed USFS survey data, but the converse was not true. Map units identified as associated with owl use generally consisted of mixed-conifer or pine-oak forest, and those units most strongly associated with owl use typically occurred on steep slopes containing rock outcrops. These ecological characteristics are consistent with existing knowledge of Mexican spotted owl habitat. We concluded that: (1) TES data was useful in identifying areas associated with owl use; and (2) with certain caveats, USFS survey data can be used in the absence of more detailed data sets. We also present an objective technique that can be used to identify a subset of owl-associated map units using flexible criteria that can be tailored to meet different objectives.

Keywords: Arizona, habitat modeling, map units, Mexican spotted owl, potential habitat, *Strix occidentalis lucida*, Terrestrial Ecosystem Survey

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Photos by Joseph L. Ganey

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Defendants' Exhibit B

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF ARIZONA

WildEarth Guardians, Plaintiff, v. U.S. Fish and Wildlife Service, *et al*., Defendants.	)	No. CV-13-00151-RCC

DECLARATION OF SHAULA J. HEDWALL

I, Shaula J. Hedwall, Senior Fish and Wildlife Service Biologist, U.S. Fish and Wildlife Service, Arizona Ecological Services Office, Southwest Region, declare as follows:

1. As a Fish and Wildlife Biologist in the Arizona Ecological Services Field Office, Southwest Region of the U.S. Fish and Wildlife Service ("FWS" or "Service"), I primarily work with fish and wildlife species listed under the Endangered Species Act of 1973 (16 U.S.C. §1531-1544), as amended (ESA). I am the FWS species lead for the Mexican spotted owl and am a member of the Mexican Spotted Owl Recovery Team. I hold a Bachelor of Science degree in Natural Resource Sciences, Wildlife Ecology and Fisheries Science from Washington State University (1993), and a Master of Science degree in Forestry with a Wildlife Ecology emphasis from Northern Arizona University (2000). I have spent almost 20 years working for FWS on ESA issues, including listing and recovery activities pursuant to section 4, recovery activities

pursuant to section 6, section 7(a)(2) interagency consultations, and incidental take permitting pursuant to section 10.

2. I played a significant role in writing the 2012 Biological Opinions (BiOps) for the continued implementation of the Land and Resource Management Plans for the 11 National Forests (NFs) in Region 3 of the U.S. Forest Service (USFS).

3. I am familiar with the litigation involving the 11 BiOps. I am also aware of recent court orders modifying and clarifying the recent decision in this matter that enjoined forest management activities in six national forests in USFS Region 3. Those national forests are the Carson, Cibola, Gila, Lincoln, Santa Fe, and Tonto NFs. I will be drafting modifications to those BiOps pursuant to this Court's recent order.

4. I have reviewed the Plaintiff's Opposition to Federal Defendants "Motion to Dissolve Injunction for the Cibola NF." I seek to clarify the process used to identify protected activity centers (PACs) and recovery habitat by land management entities across the range of the Mexican spotted owl.

5. The Recovery Plan for the Mexican spotted owl, First Revision (Recovery Plan, USFWS 2012) (USFS 009534 SUP1) defined "protected habitat" or a "PAC" as "an area established around an owl nest (or sometimes roost) site, for the purpose of protecting that area. Management of these areas is largely restricted to managing for forest-health objectives" (USFS 009942 SUP1).

6. The Recovery Plan defined "recovery habitat" as "areas outside of PACS managed as nest/roost, foraging, dispersal, and wintering habitat. Recovery habitat includes pine-oak, mixed-conifer, and riparian forests well as rocky canyons (USFS 009943 SUP1)." Recovery habitat

consists of "nest/roost replacement" habitat and "foraging/dispersal" habitat. The Recovery Plan defined "Nest/roost recovery habitat" as "areas managed to replace nest/roost habitat lost to disturbance or senescence and to provide new nest/roost habitat for a recovering owl population" (USFS 009941 SUP1).

7. In forested areas, recovery habitat is primarily ponderosa pine-Gambel oak, mixed-conifer, and riparian forest that either currently is, or has the potential for becoming, nest/roost habitat or does or could provide foraging, dispersal, or wintering habitats. Nesting/roosting habitat typically occurs either in well-structured forests with high canopy cover, large trees, and other late seral characteristics, or in steep and narrow rocky canyons formed by parallel cliffs with numerous caves and/or ledges within specific geologic formations. The Recovery Plan recommends that land management agencies manage 10 percent of pine-oak forested recovery habitat and 25 percent of mixed conifer forested recovery habitat as recovery nest/roost habitat. The Recovery Plan considers the remaining forested recovery habitat to be forage/dispersal habitat. The FWS recommends managing this habitat to replace nest/roost habitat lost due to disturbance (*e.g.*, high severity, large-scale fire) or senescence and to provide additional nest/roost habitat to facilitate recovery of the owl. We recommend managing the remainder of forested recovery habitat for other spotted owl life history needs (*i.e.*, foraging, dispersing) (USFS 009541 SUP1).

8. The Recovery Plan did not include specific management for "other forest and woodland types" (*i.e.*, pure ponderosa pine forest, spruce-fir forest, and pinyon-juniper woodland) because the Recovery Team recognized that current emphasis for sustainable and

resilient forests should be compatible with needs of the owl (USFS 009541 SUP1). Therefore, we do not track or make spotted owl habitat recommendations for these forest cover types.

9. Because the Mexican spotted owl's range extends well beyond NFS lands in Region 3, a range-wide recovery habitat map requires information from many different conservation partners and jurisdictions such as the USFS, National Park Service (NPS), Bureau of Land Management, Native American tribes (tribes), and States. The FWS works with these partners to develop and continuously update habitat data and maps pertaining specifically to those jurisdictions.

10. The FWS collaborates and coordinates with our land management partners to identify and map potential nest/roost and foraging/dispersal recovery habitat throughout each planning area that each land management entity is responsible for managing (see Appendix C, USFS 009804 SUP1). It is important to identify potential recovery nest/roost habitat so that we can delineate the planning area percentages we recommended in Appendix C - Table C.3 (USFS 009833 SUP1) and recommend appropriate management in those areas.

11. The scale at which we identify recovery habitat with our partners depends upon the scale at which the planning area occurs. For some land management entities, we have the data and information available to map out all PAC and recovery habitat at one time and apportion the 10% of pine-oak and/or 25% of mixed conifer nest/roost replacement habitat across their entire management unit. The FWS works with our partners to update this information on a regular basis because there are factors that can change the designation of an area. For example if owl surveys locate new owls resulting in what was formerly "recovery habitat" becoming PAC habitat, then we must adjust the map by adding a PAC and finding (if possible) additional

nest/roost habitat. Other factors that can, and do, result in our modifying existing PAC and recovery habitat maps are severe disturbances (*e.g.*, high severity, landscape level fire) that modifies or removes owl habitat or new information (*e.g.*, new forest stand information, remote sensing data, etc.) that improves our ability to identify potential recovery habitat.

11. The FWS does not maintain one rangewide map of identified PAC and recovery habitat because forests do not retain their characteristics in perpetuity. They become established, grow, and then enter senescence and lose characteristics favored by owls. As long-term drought and changes in fire frequency and severity have increased, we do not desire to maintain a static map of owl habitat. In addition, some land management entities (*e.g.*, NPS) and/or our tribal partners do not allow for this information to be shared or maintained on public databases where outside parties may access the information. However, this does not impede the FWS's ability to work with each management entity to meet the Recovery Plan management recommendations for providing PACs and recovery habitat (both nest/roost replacement and foraging dispersal recovery habitat) through both the Section 7(a)(1) and Section 7(a)(2) processes under Section 7 of the Endangered Species Act.

12. Pursuant to 28 U.S.C. §1746, I certify under penalty of perjury that the foregoing is true and correct.

Executed this 25th day of November 2019.

Shaula J. Hedwall

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