

# Incorporating Bird Needs into Piñon-Juniper Habitat Management in New Mexico



*New Mexico*  
*Avian Conservation Partners (NMACP)*  
<http://avianconservationpartners-nm.org/>



# NMACP Steering Committee and other Contributors

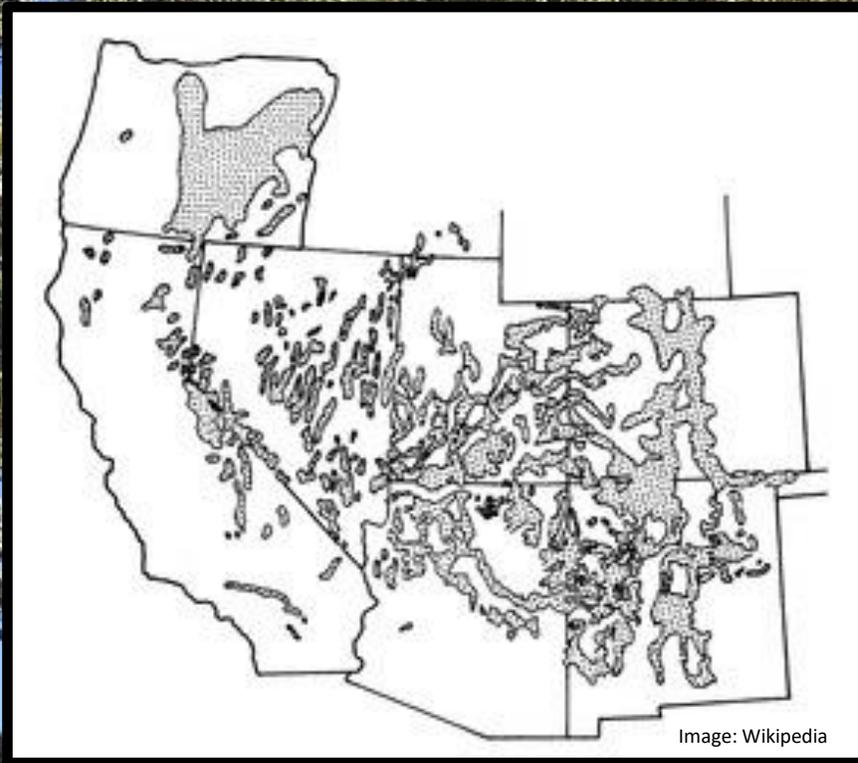
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# Introduction to Piñon-Juniper (P-J) Habitat



In the past, piñon-juniper (P-J) habitat was considered by many to be a "throwaway" habitat. Far from being a "throwaway", **P-J is a unique habitat type found nowhere else on earth that is very important for some of New Mexico's fastest declining bird species, as well as bird diversity as a whole.**

# Introduction to Piñon-Juniper (P-J) Habitat

In the past, it was also thought that P-J woodlands were taking up forage for livestock. As a result, chaining in P-J habitat was practiced across much of its range in the latter part of the 20th century. This practice has been largely discredited as a cost-effective action for increasing cattle forage.

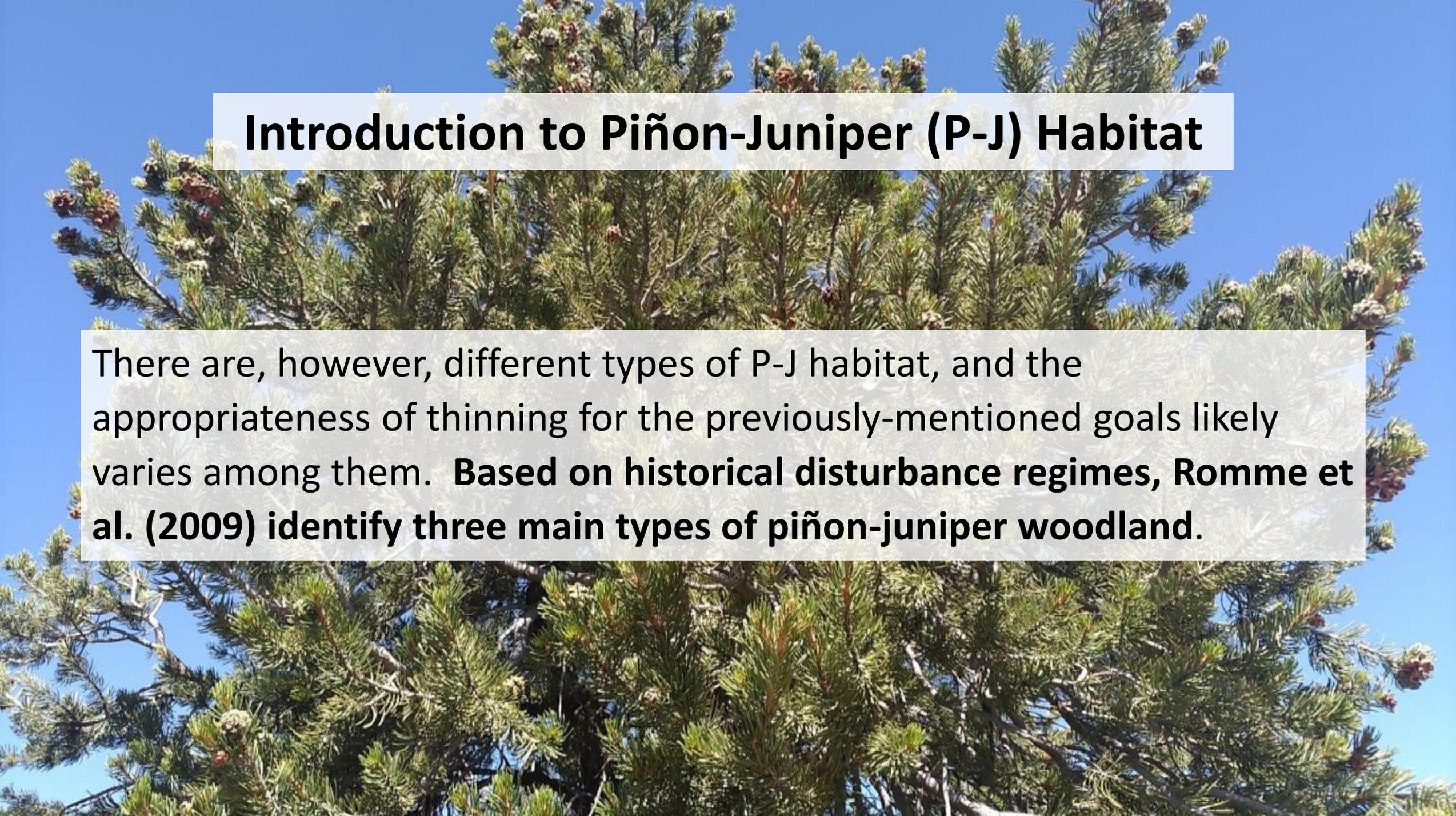


# Introduction to Piñon-Juniper (P-J) Habitat

Image: NRCS



We are now in a new phase of P-J habitat management, with thinning being conducted in a variety of ways for a variety of reasons. Goals for thinning include fuels reduction, increased cattle forage, and habitat improvement for other wildlife species.



## Introduction to Piñon-Juniper (P-J) Habitat

There are, however, different types of P-J habitat, and the appropriateness of thinning for the previously-mentioned goals likely varies among them. **Based on historical disturbance regimes, Romme et al. (2009) identify three main types of piñon-juniper woodland.**

# Introduction to Piñon-Juniper (P-J) Habitat

## *Piñon-juniper savannas (Romme et al. 2009):*

- Have low to moderate tree density, and the canopy can be dominated by piñon (*Pinus spp.*), juniper (*Juniperus spp.*), or both (*in NM, this habitat is usually dominated by juniper, thus the term juniper savanna is likely more accurate*)
- Have a dense, nearly continuous grass and forb understory, and are generally found on deeper, coarse to fine-textured soils
- Fire regimes may have included frequent, low-intensity surface fire, but currently there is little empirical evidence to support this
- Can be found throughout New Mexico, generally in lower elevations



Image: Natural Heritage NM

# Introduction to Piñon-Juniper (P-J) Habitat

## ***Persistent piñon-juniper woodlands* (Romme et al. 2009):**

- Range from sparse to dense tree cover, and the canopy can be dominated by piñon, juniper, or both
- Are often found in rugged upland areas with rocky and coarse-textured soils that do not typically support extensive ground cover plant communities
- Can have a significant oak (*Quercus spp.*) component
- Fire regimes consist of infrequent, high-severity fire, with intervals of more than 300 years
- Can be found throughout New Mexico, generally in higher elevations



Image: Natural Heritage NM

# Introduction to Piñon-Juniper (P-J) Habitat

## ***Wooded shrublands* (Romme et al. 2009):**

- Have variable tree density, from very sparse to relatively dense, and the canopy can be dominated by piñon, juniper, or both
- Shrubs are the dominant understory plants; understory shrubs can include sagebrush (*Artemisia spp.*), rabbitbush (*Chrysothamnus and Ericameria spp.*), oak, and mountain mahogany (*Cercocarpus spp.*)
- The fire regime is high severity, and likely infrequent
- Found primarily in the northwestern portion of New Mexico



Image: Natural Heritage NM

# Introduction to Piñon-Juniper (P-J) Habitat

- It is important to note that there is a significant amount of variation within these three P-J woodland types in New Mexico.
- For example:
  - Juniper is co-dominant in northern New Mexico, and oak is co-dominant in southern New Mexico.
  - Piñon and juniper tree species vary depending upon where you are in New Mexico.

# Introduction to Piñon-Juniper (P-J) Habitat



Image: Jedijoe82 / CC BY-SA (<https://creativecommons.org/licenses/by-sa/4.0>)

- Some P-J management projects are conducted on the basis that P-J woodlands are invasive and have expanded or infilled.
- **Expansion** is the spread of woodlands into habitats where there were no woodlands, such as grasslands and shrublands (Romme et al. 2009).
- **Infill** describes increasing tree densities in areas that were previously woodlands (Romme et al. 2009).

# Introduction to Piñon-Juniper (P-J) Habitat

## A few important things regarding P-J infill and expansion:

- While P-J expansion and infilling has occurred in many (but not all) areas in New Mexico, large contraction (mortality) events have also occurred. **In the future, research predicts additional extensive mortality, along with reduced mast production, slower tree growth rates, and distributional changes** (Breshears et al. 2005, 2008, Cole et al. 2008, Williams et al. 2010, Clifford et al. 2011, Redmond et al. 2012, McDowell et al. 2016, Parmenter et al. 2018, Wion et al. 2019).
- **Thus, the observed woodland infill and expansion is likely to be reversed in the future by contraction events (Romme et al. 2009).**

Image: USGS



# Introduction to Piñon-Juniper (P-J) Habitat

Expansion of  
pine and juniper at  
expense of grassland  
and shrub, in Utah,  
is a result of  
anthropogenic  
activity.  
Source:  
[www.usda.gov/forest/conservation/usa/edu/tra](http://www.usda.gov/forest/conservation/usa/edu/tra)

Image: Cynthia A. Froyd



(a) 1909



(b) 2004

## A few important things regarding P-J infill and expansion:

- P-J woodlands are dynamic ecosystems, and for thousands of years, tree densities have been driven by climatic fluctuations; therefore, **periodic expansion/infill and contraction is likely a normal ecological process in these woodlands** (Romme et al. 2009).
- Expansion or infill of P-J woodlands (where it still may be occurring) can be a result of natural climatic processes, instead of human activities (Romme et al. 2009).

# Introduction to Piñon-Juniper (P-J) Habitat

## A few important things regarding P-J infill and expansion:

- Much of the expansion experienced in the past in New Mexico likely occurred in savanna habitats. **Juniper (but NOT piñon) can be invasive in the woodland/grassland ecotone, and is often kept at bay by surface fire. This fire, however, does not normally continue up into persistent P-J woodland and wooded shrublands, because there are few fine fuels to support it.**
- Little (1977) found there was no evidence that persistent P-J woodlands were formerly grasslands that have been invaded by trees.

Image: Natural Heritage NM



# Introduction to Piñon-Juniper (P-J) Habitat

Image: Sage Grouse Initiative



## A few important things regarding P-J infill and expansion:

- In areas where expansion or infill is suspected to still be occurring, it is critical to differentiate between woodlands that are recovering from a past disturbance (past clearcutting, thinning, etc.) and woodlands that may be increasing in density or expanding. **It cannot be assumed that P-J woodlands are expanding or infilling in any particular area without local data**, such as historical photographs and dendrochronological techniques (Romme et al. 2009).
- It is also critical to understand that **with predicted future changes in climate, restoring woodlands to “historical” conditions may no longer be the best course of action** (Romme et al. 2009).

# Introduction to Piñon-Juniper (P-J) Habitat

- Thinning projects may also be conducted with the goal of improving tree or stand health.
- Scientific information regarding thinning impacts on the health of remaining trees, however, offers mixed results, with **some research suggesting thinning in persistent P-J woodlands may be detrimental to the health of remaining trees by increasing evapotranspiration from the stand** (Greenwood and Weisberg 2007, Roundy et al. 2014, Morillas et al. 2017).
- More information is needed regarding thinning impacts on tree health, but **at this point it should not be assumed that thinning will improve the health of remaining trees.**



# Introduction to Piñon-Juniper (P-J) Habitat



Images: Natural Heritage NM



- Based upon disturbance regimes, **thinning in P-J savanna is likely more appropriate than thinning in persistent P-J woodland or wooded shrubland.**
- However, as we will see in future slides, **in any of these woodland types, including savanna, the best available science suggests some approaches to thinning are detrimental for woodland-dependent birds** (Crow and Van Riper 2010, Bombaci and Pejchar 2016, Gallo and Pejchar 2016, Bombaci et al. 2017, Holmes et al. 2017, Fair et al. 2018, Johnson et al. 2018, Magee et al. 2019).

# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

NMACP priority bird species were determined using a rigorous scientific process developed by Partners in Flight. This process involved assigning each species a numerical score, with higher scores meaning higher vulnerability. For more information regarding the scoring process see [the NMACP website](#).



# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

- **In New Mexico, more of the highest scoring (and thus highly vulnerable) bird species are dependent upon P-J woodlands than any other habitat type (New Mexico Avian Conservation Partners 2016).**

## Habitat Associations for Species with Scores $\geq 19$ (out of 25)

**Piñon-Juniper Woodland: 4**

Alpine/Tundra: 2

Ponderosa Pine Forest: 2

Chihuahuan Desert Grassland: 1

Chihuahuan Desert Shrub: 1

Great Basin Desert Shrub: 1

Madrean Pine-Oak Woodland: 1

Mixed-Conifer Forest: 1

Montane Shrub: 1

Plains and Mesa Grassland: 1

Plains-Mesa Sand Shrub: 1

# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

The following priority species have more of their range-wide population in New Mexico than any other state in the Union (Partners in Flight 2019):

- Pinyon Jay
- Woodhouse's Scrub-Jay
- Juniper Titmouse
- Virginia's Warbler

New Mexico also has significant populations of many other P-J priority bird species.



# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

- P-J woodlands support a **high diversity of bird species and high numbers of bird individuals**, as compared to other western forest types (Paulin et al. 1999).
- P-J woodlands have a **high number of obligate or semi-obligate bird species**, as compared to other western forest types, and contribute significantly to landscape-level bird diversity (Paulin et al. 1999).



# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

Image: Zapata Birding



- **Pinyon Jay is one of the fastest declining bird species in New Mexico and the U.S.;** its population has declined by more than 84% since the 1960s, and its remaining population is expected to decline by an additional 50% by 2035 (Rosenberg et al. 2016, Sauer et al. 2017).
- **Because of this decline, the Pinyon Jay is recognized by NMACP as a species of concern in NM, and is also recognized as a species of concern on national and international scales** (Rosenberg et al. 2016, BirdLife International 2017).

# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

Image: Save the Rhino



Image: Noah Strycker



Image: Kevin Pluck / CC BY  
(<https://creativecommons.org/licenses/by/2.0>)



- Pinyon Jay is listed as vulnerable on the IUCN Red List, which is an *international* watch list of threatened species. Being listed as vulnerable means it faces a high risk of extinction in the wild (BirdLife International 2017).
- Other species listed as vulnerable on the IUCN Red List include the Greater One-Horned Rhino and the Lion.

# Why Take Bird Species Into Account in P-J Land Management in New Mexico?

	Population Size	Population Loss	Half-Life**
<b>Sprague's Pipit*</b>	1,400,000	~75%	24 years (from 2019)
<b>Pinyon Jay*</b>	770,000	~84%	16 years (from 2019)

\*Sprague's Pipit was once considered a candidate for listing under the U.S. Endangered Species Act. Pinyon Jay is declining faster than (Rosenberg et al. 2016, Sauer et al. 2017), and has approximately half the population of (Partners in Flight 2019), the Sprague's Pipit. **If these trends continue, it is likely only a matter of time before Pinyon Jay is petitioned for listing.**

\*\* Half-life is the number of years it will take the population that was remaining (in 2019) to decline by another 50%.





**NMACP Recommendations to Reduce  
Negative Impacts on Priority Bird  
Species When Managing P-J  
Woodlands in New Mexico**

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

- As mentioned previously, the best available science suggests some approaches to thinning in P-J woodlands are detrimental for obligate and semi-obligate bird species (Crow and Van Riper 2010, Bombaci and Pejchar 2016, Gallo and Pejchar 2016, Bombaci et al. 2017, Holmes et al. 2017, Fair et al. 2018, Johnson et al. 2018, Magee et al. 2019).
- The following recommendations are therefore offered only as ways to potentially reduce negative impacts on priority bird species when P-J management must be conducted to achieve other goals and objectives.



Photo: [www.firescience.gov](http://www.firescience.gov)

Recommendations are based upon literature reviews for the following NMACP priority P-J bird species (but recommendations are expected to reduce negative impacts for most, if not all, P-J woodland bird species in New Mexico):

**Pinyon Jay**



Image: Wallace Keck

**Gray Vireo**



Image: Brian Johnson

**Black-throated Gray Warbler**



Image: Graham Montgomery

**Juniper Titmouse**



Image: Brian Caulk

**Virginia's Warbler**



Image: Justyn Stahl

**Black-chinned Sparrow**



Image: Brian E. Small

**Woodhouse's Scrub-Jay**

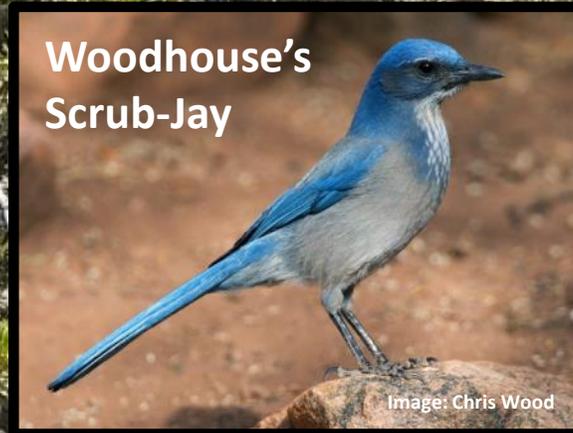
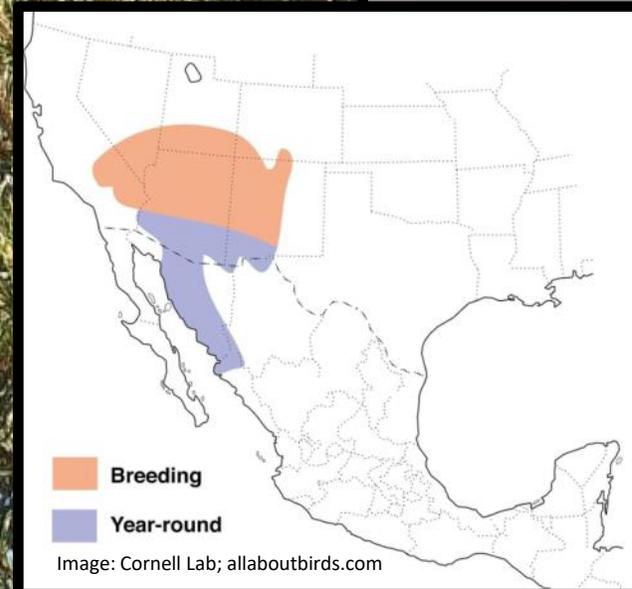


Image: Chris Wood

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

- **Bendire's Thrasher, New Mexico's highest scoring species** (and thus most vulnerable), uses juniper savanna over portions of its New Mexico range.
- **Separate recommendations for this species are in development, and will be distributed (on the NMACP listserv) when complete.** For information regarding how to sign up for the listserv, please visit the [NMACP website](#).



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

First, identify the type of P-J woodland you are working in, as appropriate management may differ depending on P-J type. Are you working in a Persistent P-J Woodland, P-J savanna, or wooded shrubland?

Images: Natural Heritage NM



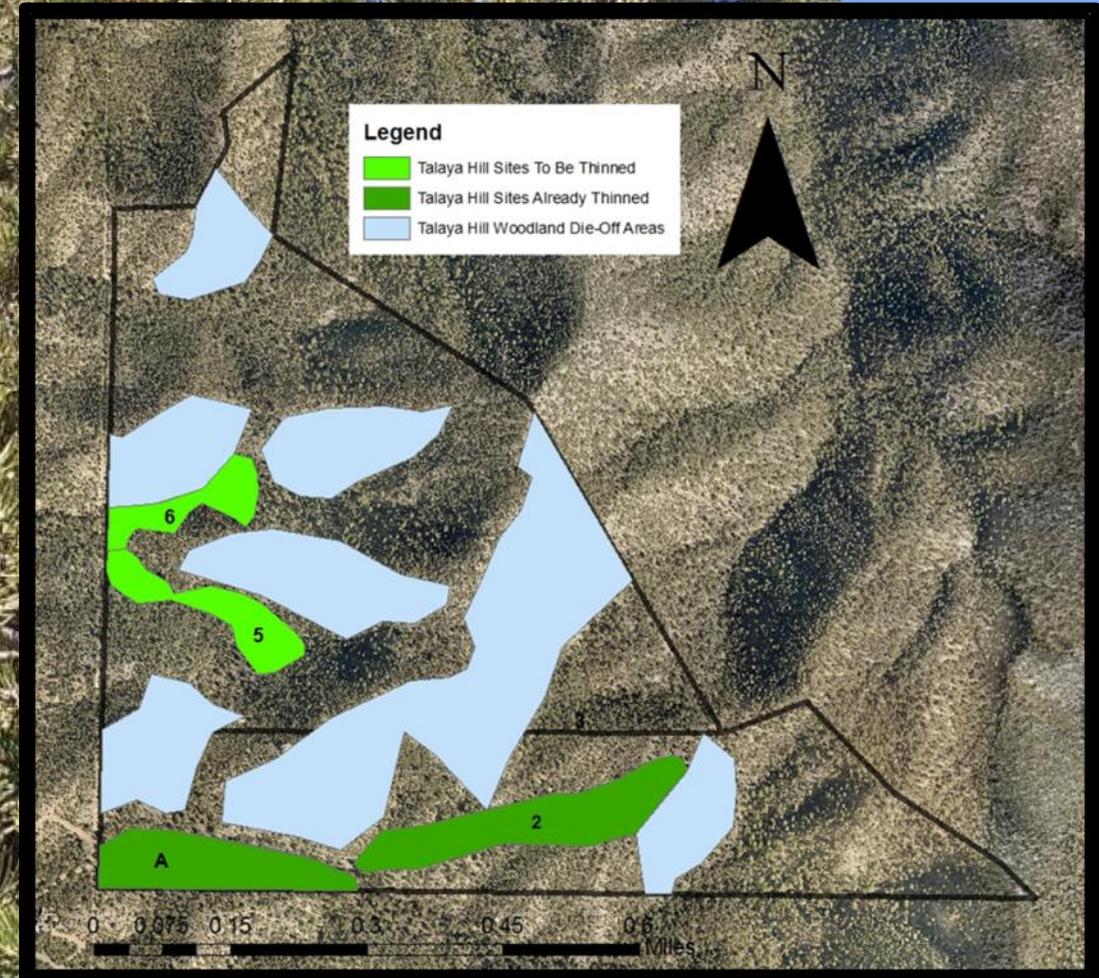
# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

- **In persistent P-J woodland and wooded shrubland, map existing openings (resulting from drought, beetle kill, or other factors) in the canopy, and determine if these areas of natural mortality may address management objectives.**
- **Nature could have done the thinning for you, and no additional thinning will be necessary.**



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

- An example of mapping existing mortality areas is Talaya Hill Open Space (owned by Santa Fe County).
- **This open space is important for P-J birds AND for protection of the Santa Fe municipal watershed.**
- **Fire staff and biology staff worked together to balance wildlife and fire prevention needs.**
- **Blue areas** represent persistent P-J woodlands that endured significant past mortality.
- **Green areas** represent ponderosa pine forest stands that were thinned, or will be thinned.
- Based upon this mapping exercise, it was determined thinning in persistent P-J woodlands could be avoided, while still meeting fuels reduction needs.



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



## *Conduct Baseline Surveys*

- **Conduct baseline bird surveys in your area of interest, with an emphasis on documenting priority bird species using the site** (see previous list).
- Ideally, these surveys should be done within a year or two of treatment commencement.
- [Contact the NMACP steering committee](#) for information regarding obtaining bird surveyors.

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Conduct Baseline Surveys*

- **Documenting Pinyon Jay use is complicated**, as they have very large home ranges and can be difficult to detect at any given point in time.
- **Training regarding how to identify Pinyon Jay flock use, including finding colony nesting locations, will be provided in spring 2020 by Dr. Kristine Johnson and Peggy Darr.** In the future, training may be provided every year, or every few years. Information regarding this training will be sent to the NMACP listerv, so if you are not on the listserv, sign up today (directions regarding how to sign up are on the [NMACP website](#)).



**If priority bird species use your site, we recommend reconsideration of the necessity of treatment.**

**Pinyon Jay**



Image: Wallace Keck

**Gray Vireo**



Image: Brian Johnson

**Black-throated Gray Warbler**



Image: Graham Montgomery

**Juniper Titmouse**



Image: Brian Caulk

**Virginia's Warbler**



Image: Justyn Stahl

**Black-chinned Sparrow**



Image: Brian E. Small

**Woodhouse's Scrub-Jay**

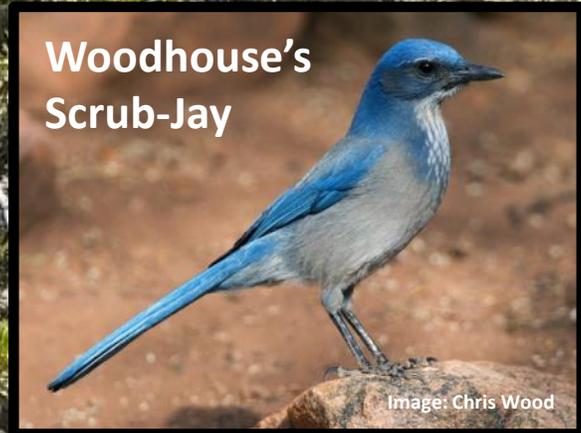


Image: Chris Wood

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Avoid impacts on nesting birds*

- If treatment must occur, and a Pinyon Jay nesting colony is located:
  - **Avoid habitat treatments** (i.e., clearcutting, thinning, burning, etc.) within the nest colony site (Somershoe et al. 2020).
  - **Retain a 500 m (0.31 mile) buffer around the colony nest site, to allow for colony shift to suitable nearby habitat** (Johnson et al. 2017a, 2018, Somershoe et al. 2020).
  - **Avoid treatments within colony sites that were active during the current and/or preceding breeding season AND at any known, inactive nest sites for up to 10 years or more, as jays may return to historical nest colony sites as resources in home ranges change** (Marzluff and Balda 1992, Johnson et al. 2018).



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Avoid impacts on nesting birds*

If treatments must occur, avoid treatment during bird breeding seasons. Note that breeding seasons differ amongst species, and many P-J priority bird species breed earlier than other bird species. **A good general date range to avoid negative impacts on most bird species in NM P-J woodlands is March 1<sup>st</sup> to July 15<sup>th</sup>.** Below are breeding season date ranges (from egg laying to fledging) for priority bird species:

**Pinyon Jay:** early March to late May (but can breed at any time of the year, so if a Pinyon Jay nesting colony is located, clearance surveys should be conducted prior to thinning to ensure they are not breeding; Balda 2002).

**Juniper Titmouse:** mid-March to late June (Cicero et al. 2017)

**Woodhouse's Scrub-Jay:** mid-March to late June (Curry et al. 2017)

**Virginia's Warbler:** Early May to Mid-July (Olson and Martin 1999)

**Gray Vireo:** mid-May to mid-August (Barlow et al. 1999)

**Black-chinned Sparrow:** mid-April to late June (Tenney 1997)

**Black-throated Gray Warbler:** early May to late June (Guzy and Lowther 2012)



Image: Alan Schmierer

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning*

- In all P-J woodland types, if treatments must occur, keep overall canopy cover reductions as small as possible.
- Magee et al. (2019) found occupancy for most P-J obligate and semi-obligate bird species declined after a treatment that reduced existing canopy cover by approximately 31% (from 36% to 5%).
- **Smaller reductions in canopy cover, that don't approach 31% (perhaps no more than 20%; but this needs more study), may help to minimize negative impacts on P-J priority bird species.**
- **Reconsider the necessity of thinning at sites with pre-treatment canopy cover of 31%, or less.**

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning*

- If thinning must occur in persistent P-J woodlands or wooded shrublands, **create a mosaic of treated and untreated patches, as opposed to evenly-spaced thinning** (Somershoe et al. 2020).
- **Conduct thinning, but not clearcutting** (Bombaci et al. 2017) **in some patches, and leave other patches completely unthinned.**
- This recommendation allows for retention of some unthinned habitat.

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning*

- In persistent P-J woodland and wooded shrubland, map existing openings (resulting from drought, beetle kill, or other factors) in the canopy, and utilize these naturally occurring mortality areas by either expanding upon them, or conducting additional thinning within them (but not clear cutting).
- This recommendation allows for retention of some unthinned habitat



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



## ***Woodland Thinning;***

### ***Determining the size and location of unthinned patches***

**Minimum: retain unthinned clumps within the territory sizes for P-J priority bird species using your site (excluding Pinyon Jay, which has a very large home range). If priority bird species are not using your site, maintain unthinned clumps within the territory size for the most abundant P-J obligate or semi-obligate bird species using your site.**

***Note:* this approach is likely not appropriate for Gray Vireo, which may have spatially-clumped nests (Lynn Wickersham personal communication); the following recommendations are better for all priority bird species, including Gray Vireo.**

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

***Determining the size and location of unthinned patches***

**Good: retain unthinned clumps within the home range sizes for P-J priority bird species using your site (excluding Pinyon Jay) AND large enough to accommodate the number of birds using the area before treatment.** For example, if two Juniper Titmice are using a part of your site, and the mean home range size is 3 acres, retain a 6-acre (or larger) unthinned patch in the location where they were found.



Image: Taylor Abbott

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



## *Woodland Thinning; Determining the size and location of unthinned patches*

**Better:** map nests of priority bird species and retain an unthinned buffer (the size of the mean/average territory for the species) around the nest(s).

**Best:** map territories of priority bird species and avoid thinning within as many territories as possible.

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning; Determining the size and location of unthinned patches***

### ***Territory sizes for priority P-J bird species (excluding Pinyon Jay):***

***Juniper Titmouse:*** mean 3 acres (Cicero et al. 2017)

***Woodhouse's Scrub-Jay:*** average 4 acres (Curry et al. 2017)

***Virginia's Warbler:*** mean 4 acres (Olson and Martin 1999)

***Gray Vireo:*** mean 8 acres (Lynn Wickersham personal communication)

***Black-chinned Sparrow:*** no information found; mean territory size for its closest relative, the Field Sparrow, is 2 acres (Carey et al. 2008)

***Black-throated Gray Warbler:*** no information found; mean territory size for the Golden-cheeked Warbler, a close relative that uses juniper woodlands, is 11 acres (Ladd and Gass 1999)

For territory sizes of other P-J obligate or semi-obligate bird species, [contact the NMACP steering committee.](#)



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



Image: Panoramio

## ***Woodland Thinning;***

### ***Determining the size and location of unthinned patches***

- When thinning in a treated and untreated mosaic, **locate unthinned patches in productive (seed producing) piñon woodlands containing large and old, or very old, trees; these trees are likely of prime piñon nut producing age** (Parmenter et al. 2018, Somershoe et al. 2020).
- Additionally, according to recent research, **provided that sufficient suitable habitat is retained throughout the treatment area, retaining as many larger trees as possible within areas of higher tree density and/or canopy cover will likely conserve more Pinyon Jay nesting habitat than thinning all size/age classes to a uniform density;** e.g., within the 25-75% quartiles of these measures at similar sites (Johnson and Sadoti 2019).

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***In Thinned Patches:***

- **Retain as many mast-producing trees as possible** (Balda 2002, Koenig et al. 2009, Cicero et al. 2017, Somershoe et al. 2020).
- **Parmenter et al. (2018) identified age of *P. edulis* as an indicator of probable nut productivity.** When conditions permit, **old and very old trees likely produce more mast** due to their larger size and number of fruiting branches (Parmenter et al. 2018).
- **In lieu of coring trees, Parmenter et al. (2018) suggested tree size as a correlate of tree age and potential nut productivity:**
  - **Little to no productivity** (<3.5 inches or <9 cm diameter at breast height [dbh])
  - **Medium productivity** (3.5-5.9 inches or 9-15 cm dbh)
  - **High productivity** (>6.3 inches or >16 cm dbh; Zlotin and Parmenter 2008)



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***In Thinned Patches:***

- Retain as many tall and densely crowned trees as possible, particularly within areas of higher tree density (Johnson et al. 2014, 2015, Johnson and Sadoti 2019, Somershoe et al. 2020).



Image: Dcrjrs/Wikimedia Commons/CC BY-SA 3.0

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning;*

### *In Thinned Patches:*

- **Retain as many large junipers as possible.**
- **Avoid preferential thinning of juniper.**
- Junipers provide berries, an essential food source for many bird species.
- Junipers also provide critical nesting habitat. Francis et al. (2011) found 86% of all nests in live juniper, and the selection of juniper was significantly higher than expected based upon the region's piñon to juniper ratio (approximately 1:1).



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning;*

### *In Thinned Patches:*

- In addition to retaining some juniper, **retain other fruiting trees and shrubs** (Curry et al. 2017).
- **Retain some trees with mistletoe** (Gillihan 2006), as it may help priority bird species by creating future snags, producing invertebrate prey, etc.



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***In Thinned Patches:***

- **Retain some trees in all size and age classes, to allow for future tree recruitment and mast production.**
- **In north- and east-facing persistent P-J woodlands, retain all (or as many as possible) tree seedlings and saplings (Pavlacky and Anderson 2001, Pavlacky and Anderson 2004).**



# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



Image: Cagan Sekercioglu

Image: ceciliaadorio.blogspot.com

## *Woodland Thinning;*

### *In Thinned Patches:*

- **Retain as much oak as possible**, in all growth forms, (large, single-stem oak; pole-sized oak clumps; shrubby oak groundcover).
- Numerous priority species use oak for nesting and foraging, and some, such as the Virginia's Warbler, depend upon it almost completely (Sedgwick 1987, Olson and Martin 1999).
- **Other deciduous trees may not be common, but if they do occur, retain them** (Olson and Martin 1999).

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning;*

### *In Thinned Patches:*

- **Retain and promote native grasses, forbs, shrubs, and cryptobiotic crust in the understory**, as this may increase available food supplies, such as invertebrates and seeds (Tenney 1997, Barlow et al. 1999, Pavlacky and Anderson 2001, Schlossberg 2006, Bombaci and Pejchar 2016, Somershoe et al. 2020).



Photo: Nihonjoe - Own work, CC BY-SA 3.0,  
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# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning;*

### *In Thinned Patches:*

- **Retain all snags (or as many as possible).**
- Juniper Titmouse is a cavity nester (Cicero et al. 2017), and many other bird species need snags.
- **Retain all trees with existing cavities (or as many as possible).**
  - **Cavities, mostly in large one-seed juniper, are used heavily** by cavity nesting species, including Juniper Titmouse (USFWS unpublished data).
  - **These cavities are often not obvious from a distance, and may occur in both live trees and snags (USFWS unpublished data).**



Image: Ted Floyd

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

Image: Jeff Mitton



## ***Woodland Thinning;***

### ***In Thinned Patches:***

- **Retain decadent/senescent trees and dead limbs;** research suggests these are a critical habitat component for Juniper Titmouse, and are important for many other bird species (Pavlacky and Anderson 2001, Gillihan 2006).
- **Retain some downed coarse woody debris** (larger than 3 inches in diameter) to provide habitat for invertebrate prey, as well as other important ecological services (Harmon et al. 1986, Grodsky et al. 2018)

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***In Thinned Patches:***

**Use lop and scatter, when possible, over other slash management methods; this method may reduce erosion, improve soil health, protect the health of the remaining trees, promote understory vegetation, and promote healthy invertebrate prey populations (Stoddard et al. 2008).**



Image: Land Care Research

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



Image: Peggy Darr

## *Woodland Thinning; In Thinned Patches:*

- **Avoid limbing retained trees**, as numerous priority bird species eat piñon pine nuts, or glean insects from piñon pine branches (Barlow et al. 1999, Balda 2002, Koenig et al. 2009, Guzy and Lowther 2012, Cicero et al. 2017, Curry et al. 2017).

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***In Thinned Patches:***

- **Avoid treatment if cheatgrass, or other invasive annual plants, are in the vicinity of the treatment area (Somershoe et al. 2020).**
- Research suggests cheatgrass may increase after thinning (Coop and Magee 2016), potentially increasing fire risk and fire intensity.
- **If you cannot avoid treatment, include aggressive invasive species control in post-treatment management plans (Somershoe et al. 2020).**
- Chambers et al. (2014) recommended a minimum of 20% perennial native herbaceous cover pre treatment to prevent a large increase in cheatgrass and other annual invasive plants post treatment.



Image: Teton County Weed and Pest District

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning;*

### *Additional Considerations for Climate Change in New Mexico*

- Managing P-J woodlands in the face of climate impacts will be very challenging; one proposed approach is to manage for climate resilience. **Three key strategies involved in managing for climate resilience, as identified by Rondeau et al. (2017), are:**
  - Identify and protect patches likely to persist in the face of climate change.
  - Proactively manage for resilience by maintaining ecological communities and processes, as well as healthy soils.
  - Accept, assist, or allow for transformation in sites where transformation is inevitable.

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***Additional Considerations for Climate Change in New Mexico***

- Some ways to manage piñon-juniper woodlands for resilience include:
  - **Favor south- and west-facing slopes for thinning, as opposed to north- and east-facing slopes**, because trees on north- and east-facing slopes may better survive future climate change scenarios , and Pinyon Jay nesting colonies tend to be located in areas of low heat load (north-facing slopes; Johnson et al. 2017b, Somershoe et al. 2020).
  - *However*, research suggests some priority species prefer south- and west-facing slopes, so **care should be taken to also maintain a mosaic of dense, unthinned and thinned patches on south- and west-facing slopes** (Pavlacky and Anderson 2000, Wickersham et al. 2020).
  - **Retain trees within drainages**, as these may survive drought better than drier areas.
  - **Retain trees in healthier soils**, as these may survive drought better than trees in poor soils.



Image: Thayne Tuason - Own work, CC BY-SA 3.0,  
<https://commons.wikimedia.org/w/index.php?curid=32519981>

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning;*

### *Additional Considerations for Climate Change in New Mexico*

- This resilience idea is new, and each manager will have to work out how best to implement it in their jurisdiction. We recommend managers work with species experts to assess the most valuable, resilient habitat patches. [Contact the NMACP Steering Committee](#) for assistance.
- **The size of patches retained for their climate resilience could be based on:**
  - The size of the site (retain as much resilient habitat as possible; e.g. north- and east-facing slopes, drainages, sites with healthier soils, etc.)
  - The bird species present or likely at the site
  - The habitat requirements of the birds present, e.g., territory sizes (or if Pinyon Jays are present, area of a typical nesting colony), number of territories on the site, or the size of an area containing healthy, productive piñon mast trees for foraging
- For example, imagine an area with a large number of Gray Vireo nesting territories, most of which occur along drainages. The areas along the drainages should be both climate resilient and preferred by vireos. These areas would be highest priority for avoiding disturbance.

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico



## *Woodland Thinning; Additional Considerations for Fuels Reduction in New Mexico*

The best available science suggests persistent P-J woodlands and wooded shrublands have a high-intensity, low-frequency wildfire regime (Romme et al. 2009). Because of this, **thinning these woodlands to reduce fire risk likely does not represent ecological restoration. Therefore, in persistent P-J woodlands and wooded shrublands, we recommend fuels reduction only take place to protect human infrastructure.**

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning; Additional Considerations for Fuels Reduction in New Mexico*

- If thinning is to occur for fuels reduction, **firebreaks to protect infrastructure are recommended in lieu of thinning large tracts of woodland.**



Image: NMSU

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## ***Woodland Thinning;***

### ***Additional Considerations for Fuels Reduction in New Mexico***

- **If thinning for fuels reduction must occur, limited research suggests retention of 15-35% canopy cover may be sufficient to stop many (but not all) P-J crown fires during extreme fire behavior (Coop and Magee 2016).**
- Retained canopy cover of 15-35% may render a site unsuitable for some P-J birds (especially at the lower end of this range); but this needs further research.
- **If the entire project area to be thinned for fuels reduction has a pre-treatment canopy cover of less than or within 15-35%, evaluate whether fuels reduction is necessary (Somershoe et al. 2020).**
- If the entire area to be thinned for fuels reduction has a pre-treatment canopy cover of greater than 15-35%, target retention of approximately 15-35% canopy cover (higher is better) in thinned patches (Somershoe et al. 2020).

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Woodland Thinning; Additional Considerations for Fuels Reduction in New Mexico*

- **Prescribed surface fire is not recommended within persistent P-J woodlands and wooded shrublands as a follow-up to thinning because, unlike ponderosa pine forests, these ecosystems likely did not evolve with frequent, low-intensity surface fires, and surface fire usually kills adult trees (Baker and Shinneman 2004, Romme et al. 2009).**
- **If thinned sites must be maintained, follow-up thinning is recommended over prescribed surface fire.**



Image: Forest Fitness, LLC

# NMACP Recommendations to Reduce Negative Impacts on Priority Bird Species When Managing P-J Woodlands in New Mexico

## *Livestock Management*

- **Avoid overgrazing** (Tenney 1997, Goguen and Matthews 1998) **and/or overuse**, as research suggests it can have negative impacts on priority species.



## *Monitoring to Help Improve Recommendations for New Mexico:*

- **More information is needed to determine impacts on birds from all types of thinning, but especially:**
  - Impacts from lighter levels of thinning (<~30% canopy cover reduction)
  - Long-term impacts from all levels of thinning
  - Impacts from different structural approaches to thinning (evenly spaced vs. a mosaic of thinned and unthinned patches)
  - Impacts from thinning in the three different P-J habitat types



## ***Monitoring to Help Improve Recommendations for New Mexico:***



- **Please help NMACP obtain needed information by conducting bird and vegetation surveys in treatment areas (pre- and post-treatment or treated vs. untreated).**
- A bird and vegetation survey protocol has been developed by NMACP, and we encourage its use to ensure consistent methods and contribute to a stronger dataset from which to make recommendations.
- **The BLM, NM State Land Office, Santa Fe County, and Bird Conservancy of the Rockies are partnering to conduct a multi-year implementation of the NMACP-developed bird/vegetation protocol starting in spring 2021. For more information regarding this protocol, or to join the current effort, please contact Margaret (Peggy) Darr at: [mjdarr@santafecountynm.gov](mailto:mjdarr@santafecountynm.gov).**

# Conclusion

- The term "piñon-juniper" covers at least three different woodland types, best management practices differ among the types, and some of New Mexico's most vulnerable bird species are closely tied to all three types of woodland.
- Vulnerable species such as the Pinyon Jay and Juniper Titmouse have more of their range-wide population in New Mexico than any other state in the Union, so what we do in P-J habitats in New Mexico is very important for the persistence of these species.
- We recommend careful consideration of the necessity of treatment in any P-J woodland, but especially in persistent P-J woodlands or wooded shrublands, or if priority bird species use your site.

# Conclusion

- If treatment must occur, we recommend incorporation of as many recommendations included here as possible, to potentially lessen impacts on priority bird species.
- We also highly recommend bird monitoring before and after treatment to help refine habitat management recommendations.
- To stay informed regarding bird habitat needs in P-J woodlands, please sign up for the NMACP listserv; directions regarding how to sign up may be found on the [NMACP website](#).

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**Questions?**