Size, position, and composition of residual slash (e.g., big pieces mixed in with small) are important but, I think with most things in wildlife, there is diversity.

Pile ‘habitat’ separate from slash to alleviate worries about fire. The small stuff should get piled as normal and the larger stuff goes into separate piles that are retained.

Fishers were studied using slash piles as maternal dens just north of California on the Klamath Plateau (i.e., between Ashland and Klamath Falls). In a study, 13% of maternal rest structures were slash piles and 64% of our female rest sites were slash piles or logs.

One study monitored 69 stands with multiple piles. Where fishers were detected in proximity, they were also detected at piles within 53% of the stands (14 of 26). Small mammal diversity was fairly high and often – in this study – had a high amount of prey resources (boxplots).

The details are much more nuanced. Meanwhile, current data likely suggest that larger piles on the landscape with larger diameter wood pieces (longer) and spaces within the pile are likely better for fishers and movement than no understory structure whatsoever.

In general, regarding piles and conservation – studies were finding roosting bats, salamanders, and small mammals (of course).

Here (below) is some language regarding burn pile retention for wildlife habitat from projects on my old forest. There was no specific requirement other than general guidance to retain necessary wildlife structures which included logs and snags. Retention number and location of burn pile retention was recommended based on site specific conditions and negotiations with the fuels staff to ensure the location of placement would not cause suppression issues. Pile retention is also designed based on the needs of the species in the specific location. Below is language from the environmental analysis for pile retention of both a fire salvage and standard vegetation management project.

**Fire Salvage Project**

Where available, approximately 15 tons of large woody debris per acre would be retained within treatment areas. Where existing conditions do not meet or exceed these levels, the requirement is to retain as close to these levels as feasible. Lop/scatter and mastication of smaller material would reduce soil erosion, which may facilitate establishment of flowing plants in subsequent years. In addition, where activity-generated materials are piled and burned, an average of one pile per acre would be retained. Maintenance of large woody debris and some piles as specified in the management requirements for the project is expected to provide cover for rodent species and the future availability of abandoned rodent dens for nesting and hibernation.

Where activity generated vegetation is piled, retain an average of 1 pile per acre; preferentially retain piles that are in close proximity to the following: large live trees (>24”), patches of live trees, large oaks (>24”), large snags (>24”), snag patches, and RCAs.

**Veg Management Project**

Wildlife Cover

a) Within all thinning, fuels reduction and underburn areas, piles would be selected to retain, generally averaging one pile per acre, or as otherwise coordinated with the natural resource specialists.

b) Piling within the drip line of large conifer and hardwood trees, snags, and large downed logs would be avoided.

Underburning could alter the quantity and spatial distribution of down wood and ground vegetation, which may temporarily alter local small mammal populations. Small mammals use downed wood and herbaceous vegetation as travel corridors, hiding cover, and foraging. These structural components of forests may also be important for moderating microclimate, especially at the forest floor. Management requirements include the retention of piles for wildlife cover habitat in treated areas, in order to mitigate the temporarily reduced cover (e.g., hiding and thermal) that would occur within fuels reduction and thinning areas.

There is also a fair amount of support for slash piles as important wildlife habitat in the popular ‘literature’, and numerous mentions in scientific literature, but not many (thus far) research papers focused on quantifying the benefits for wildlife.

**References from literature regarding the use of slash piles by wildlife communities:**

Wildlife such as **song birds, voles, chipmunks, squirrels, rabbits, salamanders, frogs, lizards, snakes, and insects** use piles as dens or nesting spots, to shelter from bad weather, to escape predators, and to forage.

REF: <https://www.nnrg.org/habitat-piles/>

These piles **provide excellent habitat for many species that call the forest home**. Small mammals such as mice, voles, squirrels, and rabbits use ...

REF: <https://downeastlakes.org/brush-piles-for-wildlife-habitat/>

New research in southern Oregon indicates, however, that these slash piles **may provide habitat for voles, squirrels, and other small mammals** ...

REF: <https://www.fs.usda.gov/pnw/pnw-research-highlights/slash-piles-may-benefit-pacific-marten-providing-habitat-prey>

Brush piles **provide areas for nesting, resting, escape from predators, and protection from harsh weather conditions**. Brush piles may be built to various dimensions based on the size of available material.

REF: <https://portal.ct.gov/DEEP/Wildlife/Fact-Sheets/Brush-Piles-for-Wildlife>

Brush piles offer shelter and safe havens for all manner of birds and small mammals. They offer protective covering, an escape from predators, as well as warmth in the winter and cooling shade in the summer. In the tangle of branches, birds build nests and mammals hollow out dens. Generally speaking, consider these two types of brush piles…

REF: <https://landmarkwildlife.com/slash-and-learn-the-benefits-of-downed-brush/>

Brush piles, including treetops and other slash, provide roost and nest sites for some birds, cover for chipmunks and rabbits, and may provide a safe spot for a newborn fawn. Animals as large as bears use brush piles in remote forested areas for denning.

REF: <https://vtfishandwildlife.com/sites/fishandwildlife/files/documents/Learn%20More/LandownersGuide/3.%20Habitat.pdf>

**Studies on the subject of slash pile retention for wildlife:**

New research in southern Oregon indicates, however, that these slash piles **may provide habitat for voles, squirrels, and other small mammals** ...

REF: <https://www.fs.usda.gov/pnw/pnw-research-highlights/slash-piles-may-benefit-pacific-marten-providing-habitat-prey>

[Fate of Postharvest Woody Debris, Mammal Habitat ... - MDPI](https://www.mdpi.com/1999-4907/12/5/551/pdf)

[https://www.mdpi.com › pdf](https://www.mdpi.com/1999-4907/12/5/551/pdf) PDF by TP Sullivan · 2021 · Cited by 2 — These include: (1) **piles** for **wildlife** habitat; (2) ... particularly the residue (**slash**) occurring after conventional and salvage harvesting ...

REF: [Fate of Postharvest Woody Debris, Mammal Habitat ... - MDPI](https://www.mdpi.com/1999-4907/12/5/551/pdf)

[https://www.mdpi.com › pdf](https://www.mdpi.com/1999-4907/12/5/551/pdf) PDF

[**Community**occupancy responses of small mammals to restoration treatments in ponderosa pine forests, northern Arizona, USA](https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/11-0758.1)

[EL Kalies](https://scholar.google.com/citations?user=jgzzx4EAAAAJ&hl=en&oi=sra), [BG Dickson](https://scholar.google.com/citations?user=TZcEU1QAAAAJ&hl=en&oi=sra), [CL Chambers](https://scholar.google.com/citations?user=symDhOIAAAAJ&hl=en&oi=sra)… - Ecological …, 2012 - Wiley Online Library

… of **slash** **piles** on the landscape for several years (**piles** in our … of the small mammal
**community**. However, because the … environments on which native **wildlife** **communities** depend. …

**[HTML]** [Woody Material](https://books.google.com/books?hl=en&lr=&id=QfPc518bbdkC&oi=fnd&pg=PA78&dq=slash+piles+wildlife+communities&ots=P4sQRg33ti&sig=mUZWF-CPq6eCSknxwJZKQFIIISo)

C Maser, RG Anderson, K Cromack Jr… - **Wildlife**habitats in …, 1979 - books.google.com

… stages of the stand, the existing **wildlife** **community**, the size and structural changes of the …
effectiveness as **wildlife** habitat. For example, a log can be moved away from a **slash** **pile** to be …

Save Cite [Cited by 758](https://scholar.google.com/scholar?cites=3053234667526724692&as_sdt=2005&sciodt=0,5&hl=en) [Related articles](https://scholar.google.com/scholar?q=related:VJzW3cBEXyoJ:scholar.google.com/&scioq=slash+piles+wildlife+communities&hl=en&as_sdt=0,5&as_vis=1) [All 5 versions](https://scholar.google.com/scholar?cluster=3053234667526724692&hl=en&as_sdt=0,5&as_vis=1)

[A review of **wildlife**changes in southern bottomland hardwoods due to forest management practices](https://link.springer.com/article/10.1007/BF03160620)

T Bently Wigley, TH Roberts - Wetlands, 1994 - Springer

… **wildlife**. In this paper, we review and summarize key results from extant literature pertaining
to timber harvesting and its effects on **wildlife** **communities** in … if logging **slash** is not **piled** and …

Save Cite [Cited by 49](https://scholar.google.com/scholar?cites=16144778443317925513&as_sdt=2005&sciodt=0,5&hl=en) [Related articles](https://scholar.google.com/scholar?q=related:iVZZm3TGDeAJ:scholar.google.com/&scioq=slash+piles+wildlife+communities&hl=en&as_sdt=0,5&as_vis=1) [All 3 versions](https://scholar.google.com/scholar?cluster=16144778443317925513&hl=en&as_sdt=0,5&as_vis=1)

[**Wildlife**ecology and forest habitat](https://rex.libraries.wsu.edu/esploro/outputs/report/Wildlife-Ecology-and-Forest-Habitat/99900502812301842?institution=01ALLIANCE_WSU)

JH Creighton, DM Baumgartner - 1997 - rex.libraries.wsu.edu

… **Slash** **piles** provide roosting cover for quail and wild turkey, and hiding cover for small …
of **wildlife** habitats. Each successional stage, or plant **community**, has a **wildlife** **community** …

Save Cite [Cited by 10](https://scholar.google.com/scholar?cites=2049458839590979757&as_sdt=2005&sciodt=0,5&hl=en) [Related articles](https://scholar.google.com/scholar?q=related:rciaw_QjcRwJ:scholar.google.com/&scioq=slash+piles+wildlife+communities&hl=en&as_sdt=0,5&as_vis=1) [All 8 versions](https://scholar.google.com/scholar?cluster=2049458839590979757&hl=en&as_sdt=0,5&as_vis=1)

[Assessing forest **wildlife**diversity in Pennsylvania](https://academic.oup.com/njaf/article-abstract/15/2/77/4788394)

HM Cleveland, JC Finley - Northern Journal of Applied Forestry, 1998 - academic.oup.com

… of **wildlife** **communities**, at the stand level, by associating identified structural habitat
characteristics with groups of **wildlife** … below frost line, caves Dead and down logs and **slash** **piles** …

Save Cite [Cited by 6](https://scholar.google.com/scholar?cites=11068894496186265404&as_sdt=2005&sciodt=0,5&hl=en) [Related articles](https://scholar.google.com/scholar?q=related:PG91FeacnJkJ:scholar.google.com/&scioq=slash+piles+wildlife+communities&hl=en&as_sdt=0,5&as_vis=1) [All 3 versions](https://scholar.google.com/scholar?cluster=11068894496186265404&hl=en&as_sdt=0,5&as_vis=1)

**References to articles about how many large piles per acre are enough:**

Aim for **2 to 3 piles per acre**, about 100 feet apart. Pro-tip: Avoid using green (recently pruned) Douglas-fir or ponderosa pine boughs in the piles from January to August to avoid attracting undesirable beetles to your forest – wait for these branches to dry a season before adding them into a pile.

[REF: Keeping Dead Wood and Creating Wildlife Habitat Piles](https://www.nnrg.org/habitat-piles/%22%20%5Cl%20%22%3A~%3Atext%3DAim%20for%202%20to%203%2Cadding%20them%20into%20a%20pile.)

Brush Piles for Wildlife - CT.gov

https://portal.ct.gov › DEEP › Wildlife › Fact-Sheets

 Brush piles may be built to various dimensions based on the size of ... **3 brush piles per acre**, evenly distributed across the project site.

[Indiana Wildlife Brush Pile Job Sheet - IN.gov](https://www.in.gov/dnr/fishwild/files/Wildlife_Brushpile_Jobsheet.pdf)

[https://www.in.gov › dnr › fishwild › files › Wildl...](https://www.in.gov/dnr/fishwild/files/Wildlife_Brushpile_Jobsheet.pdf)

PDF

Brush piles can be fashioned in many ... habitat, create **at least two piles per acre**. ... to reduce any large entrances, particularly near the folded.

Rabbitat - Natural Resources Institute

https://erc.cals.wisc.edu › files › 2017/09

PDF

A good rule of thumb is to build **two to four brush piles per acre**, spaced about 100-150 feet apart. Forest wildlife quickly inhabit brush piles, especially ...

8 pages

Brush Piles - Maryland's Wild Acres

https://dnr.maryland.gov › Pages › habitat › wabrush

In areas cleared of natural wildlife cover, it is best to build at **least three or four brush piles per acre**. To help conceal wildlife traveling along ...

[Not just another stack of dead branches: Habitat piles for wildlife](https://washingtondnr.wordpress.com/2017/02/14/not-just-another-stack-of-dead-branches-habitat-piles-for-wildlife/)

[https://washingtondnr.wordpress.com › 2017/02/14 › n...](https://washingtondnr.wordpress.com/2017/02/14/not-just-another-stack-of-dead-branches-habitat-piles-for-wildlife/)

Quantity: As a target, try **two piles per acre**, about 100 feet apart, preferably in clusters of three to allow birds and small mammals to live in ...

**References related to evaluating the size of the pile as a factor:**

Brush piles **provide areas for nesting, resting, escape from predators, and protection from harsh weather conditions**. Brush piles may be built to various dimensions based on the size of available material.

REF: <https://portal.ct.gov/DEEP/Wildlife/Fact-Sheets/Brush-Piles-for-Wildlife>

Design: **The goal is to create a long-lived structure with internal openings for wildlife to use**. Therefore, larger material goes into the lowest ...

REF: <https://washingtondnr.wordpress.com/2017/02/14/not-just-another-stack-of-dead-branches-habitat-piles-for-wildlife/>

“Generally, brush piles of this type should range between 10 to 15 feet in diameter, and 5 to 8 feet in height. The most common design is built using logs (arranged in a tic-tac-toe pattern) for the foundation and covered with brush. Start with the largest material on the bottom to provide hiding space under the pile. Shallow depressions can also be dug before beginning the brush pile to provide more space.”

REF: <https://landmarkwildlife.com/slash-and-learn-the-benefits-of-downed-brush/>

These should be **at least 10 feet in diameter and 5 feet high**, to provide some interstitial space for small animals to get inside. Be creative and consider what might be able to live there. Make an entrance big enough for a bobcat or coyote.Jun 11, 2019

[REF: Healthy Habitat Piles — Or, Being Down With Downed Wood |](https://foreststewardshipnotes.wordpress.com/2019/06/11/healthy-habitat-piles-or-being-down-with-downed-wood/%22%20%5Cl%20%22%3A~%3Atext%3DThese%20should%20be%20at%20least%2Cfor%20a%20bobcat%20or%20coyote.)

Brush Piles for Better Wildlife Habitat

https://woodlandinfo.org › Blog

To do that you need to build a stout foundation. We use sticks/branches that are **about four feet long and four to six inches in diameter**. Lay ...

**Articles evaluating the length of time the pile remains on the landscape as a factor:**

Any pile can be good habitat for a period of time. Old slash piles **often have considerable evidence of wildlife use**. Leave them when you can.

REF: <https://sflonews.wordpress.com/2017/02/13/pile-it-on-habitat-piles-for-wildlife/>

[Pile it on! Habitat Piles for Wildlife](https://sflonews.wordpress.com/2017/02/13/pile-it-on-habitat-piles-for-wildlife/)

[https://sflonews.wordpress.com › 2017/02/13 › pile-it-o...](https://sflonews.wordpress.com/2017/02/13/pile-it-on-habitat-piles-for-wildlife/)

Although often burned by landowners, an intact brush pile will provide **good habitat for a few years**. As decay works on the material, brush piles ...

Fate of Postharvest Woody Debris, Mammal Habitat ... - MDPI

https://www.mdpi.com › pdf

PDF

by TP Sullivan · 2021 · Cited by 2 — The longevity of **the structures may depend on the materials in the piles (e.g., tree species and climate**) in terms of decay and functionality. ...

In a recent OFRI newsletter, there was a link to a Blog article on wildlife shelter [Gimme shelter | OregonForests](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Foregonforests.org%2Fnode%2F960&data=05%7C01%7CDennis.Hall%40fire.ca.gov%7C8ff3223bdd9845e067db08dadfbd91dc%7C447a4ca05405454dad68c98a520261f8%7C1%7C0%7C638068302528351753%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=A9qho0OyFR9u8vVE62iRFOTgTuayl7ArhOf4kR1%2Fdgw%3D&reserved=0) which had a link to Northwest Natural Resource Group guidelines for habitat piles [Keeping Dead Wood and Creating Wildlife Habitat Piles: Some Guidance for Forest Owners – Northwest Natural Resource Group (nnrg.org)](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nnrg.org%2Fhabitat-piles%2F&data=05%7C01%7CDennis.Hall%40fire.ca.gov%7C8ff3223bdd9845e067db08dadfbd91dc%7C447a4ca05405454dad68c98a520261f8%7C1%7C0%7C638068302528351753%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=i9DRKGqf63ezRdtbyOiEobAwFJ%2FHEzfwa8J9yTM8e%2BM%3D&reserved=0) and for managing slash piles [Managing Logging Slash Piles in Northwest Oregon | OregonForests](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Foregonforests.org%2Fpub%2Fmanaging-logging-slash-piles-northwest-oregon&data=05%7C01%7CDennis.Hall%40fire.ca.gov%7C8ff3223bdd9845e067db08dadfbd91dc%7C447a4ca05405454dad68c98a520261f8%7C1%7C0%7C638068302528351753%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=mIJLDqHnyCB5x0bIS8tQ1yRCEiXhbmF96sripodK7%2FY%3D&reserved=0) and here [OFRI\_slash-pile-guide\_WEB.pdf (oregonforests.org)](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Foregonforests.org%2Fsites%2Fdefault%2Ffiles%2F2021-03%2FOFRI_slash-pile-guide_WEB.pdf&data=05%7C01%7CDennis.Hall%40fire.ca.gov%7C8ff3223bdd9845e067db08dadfbd91dc%7C447a4ca05405454dad68c98a520261f8%7C1%7C0%7C638068302528507980%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=CARVDAkzFc3NkGOSLNUXbqB0tozhSdJmm%2FeHeLlPpg4%3D&reserved=0)