Pacific Marten, Coastal Distinct Population Segment

(Martes caurina)

5-Year Review:
Evaluation and Summary

U.S. Fish and Wildlife Service
Arcata Fish and Wildlife Office
Arcata, CA

5-YEAR REVIEW
Pacific Marten, Coastal Distinct Population Segment (*Martes caurina*)

GENERAL INFORMATION

Species: Pacific marten, coastal Distinct Population Segment (*Martes caurina*)
Date listed: November 9, 2020
FR citation(s): 85 Federal Register (FR) 63806
Classification: Threatened with a Section 4(d)
Critical Habitat Designation: 89 FR 46576

State Listing:

The state of California classified the subspecies of Humboldt marten (*Martes caurina humboldtensis*), which is synonymous with the coastal distinct population segment of Pacific marten, as endangered in 2019 (California Natural Diversity Database [Diversity Database] 2025, p. 25).

BACKGROUND

FR notice citation announcing this status review:
[Service] U.S. Fish and Wildlife Service. 2024. Endangered and Threatened Wildlife and Plants; Initiation of 5-year Status Reviews of 59 Pacific Southwest Species. October 16, 2024.

We received a letter in response to this notice from Center for Biological Diversity containing relevant information for this review and recommending uplisting to endangered due to increased threats. Information provided in this letter has been incorporated into this status review as appropriate.

Most recent status review:
[Service] U.S. Fish and Wildlife Service. 2020. Endangered and Threatened Wildlife and Plants; Threatened Species Status for Coastal Distinct Population Segment of the Pacific Marten With a Section 4(d). 85 FR 63806 (October 8, 2020)

This is the first 5-year status review since listing.

Species overview:
The listed entity is the coastal distinct population segment (DPS) of the Pacific marten that is synonymous with the subspecies known as Humboldt marten (*Martes caurina humboldtensis*) and hereafter referred to as coastal marten. The coastal marten is a medium-sized carnivorous mammal in the weasel family Mustelidae. The coastal marten occurs in fog-influenced forests characterized by heterogenous composition and structure and dense, ericaceous (acid-loving) shrubs of coastal Oregon and California. Coastal marten are characterized by a long and narrow body with overall brown fur with an orange to cream patch on the throat and upper

chest, large and distinct triangular ears, and a bushy tail that is proportionally equivalent to about 75 percent of the head and body length (Clark *et al.* 1987, p. 2; Powell *et al.* 2003, p. 636). Coastal marten occur primarily in late-seral, structurally-complex, heterogeneous forests, although there are three small populations occupying the younger coastal shore pine forest in the dune ecosystem of central coastal Oregon and one small population in younger industrially managed forests near Trinidad, California (Service 2025, in review). All of these habitats contain dense ericaceous shrub communities that provide refuge from predators and habitat for prey items.

Coastal marten historically ranged from the Columbia River, Oregon to Sonoma County, California but have not recently been detected throughout much of their historical range despite surveys being conducted across much of the formerly occupied area. The species was thought to be extinct until 1996 when a single coastal marten was captured on camera during fisher surveys in northern California. Coastal marten currently occupy seven small and isolated population areas and are absent from the northern and southern ends of their historical range, approximately 11 percent of its known historical range (Figure 1). Overall, there are fewer than 400 individuals estimated across the range and there is no available information on rangewide population trends (Service 2025, in review).

Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened species and endangered species to determine whether its status has changed, and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) evaluated the biology and status of the coastal marten as part of a Species Status Assessment (SSA) update to inform this 5-year review.

In 2018, a Service Writing Team created the SSA report to inform listing and is updating the SSA with new information to inform recovery planning and consultations (USFWS 2026, in review). The SSA report represents our evaluation of the best available scientific information, including the resource needs and the species' current and future conditions. We developed three future scenarios of environmental and management conditions to assess the viability of the species in the future. Independent peer and technical reviewers, along with partner representatives, have reviewed the SSA report and any necessary revisions are being made.

REVIEW ANALYSIS

Is there relevant new information for this species regarding the application of the DPS policy?:

Previous genetic work using both nuclear and mitochondrial DNA supported the discreteness of the coastal DPS of Pacific marten (Schwartz *et al.* 2020, entire) which was outlined in detail in a previous 12-month finding (79 FR 35509). A more recent and higher resolution analysis of a 141-region panel of single nucleotide polymorphisms confirmed that the coastal marten DPS is genetically distinct from other Pacific marten populations in Oregon and California and aligns with the boundaries of the subspecies (*Martes caurina humboldtensis*) as identified in Figure 1 (Moriarty *et al.* 2024a, p. 1) and supports both the discreteness and significance of the DPS as originally described.

Updated Information and Current Species Status

Biology and Habitat:

Since publication of the original SSA and final listing rule there have been numerous research projects and publications that update our understanding of coastal marten biology and habitat use. The most relevant new information on biology and habitat use is summarized below and discussed in greater detail in the updated SSA (Service 2025, in review).

Historical and Current Range

Based on new genetic analyses (Hallerud *et al.* in review) and contemporary survey efforts we revised both the historical range and extant population areas (Figure 1). The former historical range was based largely on trapping records and very limited survey effort while the updated historical range considers the genetics and boundaries of other subspecies in California and Oregon as well as ecoregions that likely influenced the previously occupied range (Hallerud 2024 pers. comm.). The currently occupied range has also changed based on contemporary survey efforts and higher resolution genetic analyses. Notably, the two California populations formerly described in the 2019 listing are now merged into one large population based on detections between them and there is a new, small population identified in California on privately owned industrial timberland based on new survey observations from 2023 and beyond. In Oregon, the population boundaries have not changed extensively, however, genetic information indicates the areas occupied along the coastal strand of shore pine-dominated forest around Coos Bay that were previously treated as one population are not functioning as one population. We have updated that area to reflect genetic information that suggest there are likely three populations functioning separately and impacted by large barriers to connectivity including large waterbodies (Umpqua River and Coos Bay) and dense population centers (Coos Bay and North Bend). Overall, we do not have information that the overall range-wide abundance of coastal marten has changed but the way we describe the current range changed from four extant population areas to seven extant population areas (Figure 1).

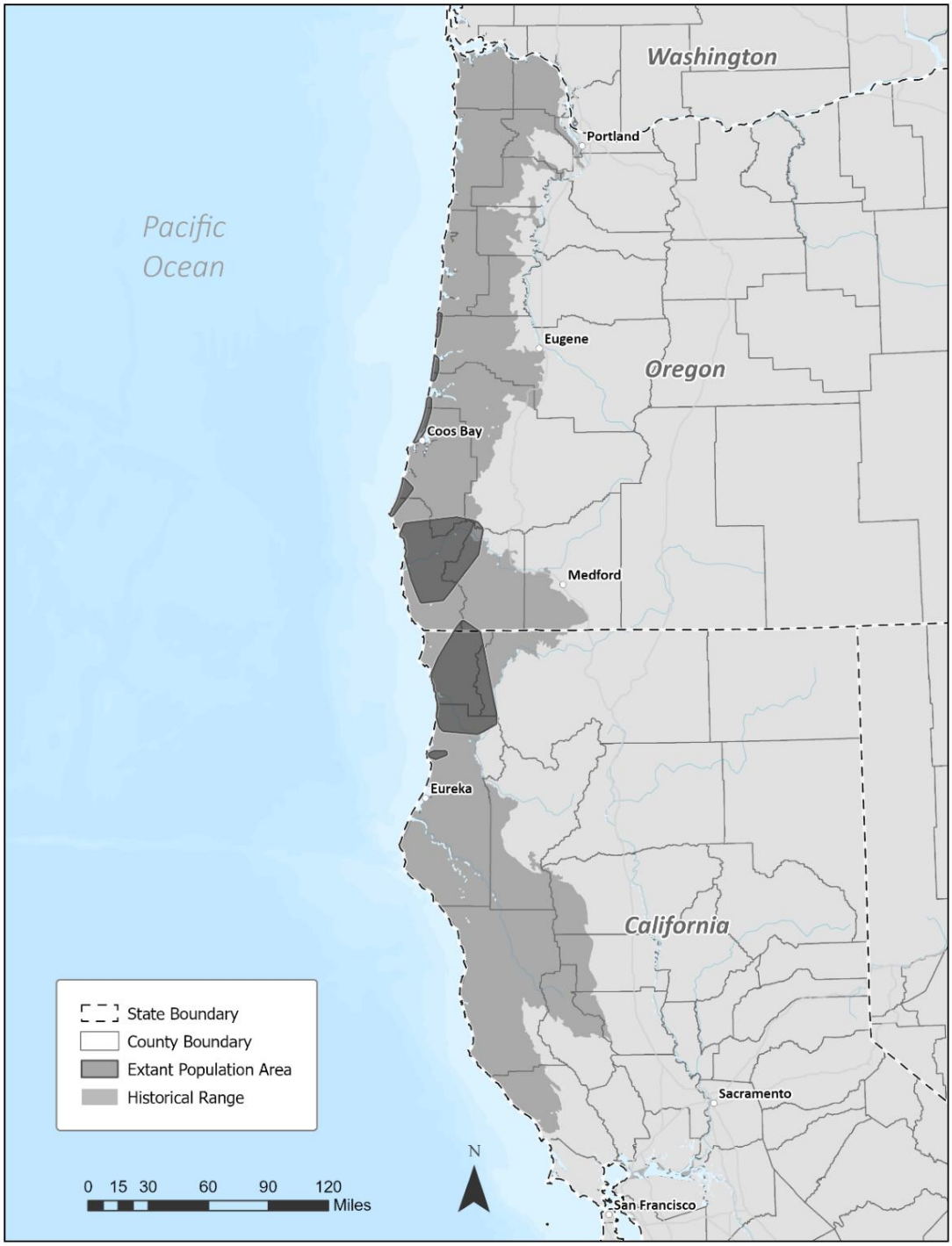

Figure 1. Darker gray polygons represent the boundaries of the seven extant population areas based on contemporary survey effort and lighter gray areas indicate the marten historical range.

Genetics

Recent efforts have increased our knowledge of coastal marten genetic structure substantially. The first single nucleotide polymorphism (SNPs) panels were analyzed and filtered for coastal marten allowing both individual identification from scat and tissue as well as analyzing population structure (Moriarty *et al.* 2024a, p. 2). Then three separate methods were used to assess population structure which all agreed on four major findings. First, coastal marten are genetically unique from other marten populations in Oregon and California as described above in relationship to the DPS policy (Moriarty *et al.* 2024a, p. 3). Second, coastal marten in the central coastal Oregon population north of the Umpqua River cluster separately from other coastal marten populations. Third, coastal marten in the population south of the Umpqua River form another cluster within the population to the south, suggesting a more recent loss of connectivity between these populations and those to the south. Fourth, all other coastal marten sampled across the range (including those in southern Oregon, northern California, and the new population near Trinidad, California) cluster together, indicating recent genetic connectivity between parts of Oregon and California (Moriarty *et al.* 2024a, pp. 3-4). It takes multiple generations for fragmented and disconnected populations to show genetic differentiation. Therefore, these results may not reflect the current state of connectivity, but it appears these populations were connected somewhat recently. Specifically, one of the models used to assess genetic population structure did not see evidence of isolation between southern Oregon and northern California populations, fixation index values reflect low to moderate levels of differentiation which may be suggestive of more recent isolation (Moriarty *et al.* 2024a, pp. 4, 22). Across all populations, genetic diversity of coastal marten is lower compared to other subspecies and inbreeding levels are generally higher, especially in the central coastal Oregon populations, with the exception that individuals in the northern California population have heterozygosity and inbreeding coefficients similar to those found in other subspecies (Moriarty *et al.* 2024a, p. 4). These results may reflect a combination of recent and historical bottlenecks and lower genetic diversity is commonly associated with a loss of adaptive capacity and lower overall resilience.

Habitat Use

There is no single, universally accepted definition of coastal marten habitat, however common features are the heterogeneous forests often found in mature forest or otherwise structurally-complex forested areas. Since listing we have updated our description of coastal marten habitat to reflect the variety of stand ages occupied and to emphasize the reliance on a dense, ericaceous shrub layer unique to this DPS and which likely mimics the presence of snowpack found in all other North American marten habitats (Delheimer *et al.* 2023, p. 15; Smith *et al.* 2022, entire). In the sections below we summarize relevant new information for the four primary spatial scales for which marten select habitat.

Microsite: Marten have high metabolic rates and limited capacity to store body fat thus behavioral thermoregulation is necessary and microsites provide resting areas to support this as well as denning sites for rearing kits (Delheimer *et al.* 2023, entire). Of 94 rest sites described in northern California most marten used live trees (63 percent, n=59) followed by

snags, slash piles, logs, rock piles, and stumps respectively (n=17, 8, 6, 3, and 1 respectively). Used plots had larger diameter trees (average >40 cm dbh) and larger diameter logs (average 45-55 cm) compared to available plots (Delheimer *et al.* 2023, p. 5). In southern Oregon, resting locations occurred in live tree or snag cavities (65%), rock outcrops (17%), subterranean cavities (12%), or on live branch platforms (6%) (Moriarty *et al.* 2024a, p. 6). These rest locations were in areas dominated by Douglas-fir and tan-oak or chinquapin with Pacific rhododendron and salal dominating the understory with 60-75 percent shrub cover and 85-90 percent visual obstruction (or horizontal cover) (Moriarty *et al.* 2024a, p. 21). Coastal martens that occupy shore pine forest in Oregon use rest structures that included squirrel nests in trees (most commonly), bare branches, and underground in basal hollows from old, overturned trees (Moriarty *et al.* 2024a, p. 6).

Stand scale: Martens select forest stands that provide habitat structure supporting one or more life history needs that include foraging, resting, or denning. For example, many of the plot level features surrounding rest and den microsites are characterized by higher levels of forest heterogeneity and structural complexity including large logs, presence of larger trees, canopy cover heterogeneity, and increased shrub cover (Delheimer *et al.* 2023, p 14). All other North American marten subspecies occur in areas with dense snowpack for portions of the year and their bodies are highly adapted to movement through snow (Smith *et al.* 2022, p. 8) but persistent snowpack is not a common feature across the coastal marten range. It appears that shrub cover serves as a proxy function where snow cover is absent and provides similar obstacles to predator movement and diet subsidization (Eriksson *et al.* 2019, entire; Delheimer *et al.* 2023, p. 15).

Home range scale: Martens establish home ranges to encompass their year–round resource needs as well as, during the breeding season, access to members of the opposite sex. More recent work has documented coastal marten home ranges in the matrix of private forest managed for timber production in California and heterogenous, structurally-complex shore pine forests of Oregon, however reproduction has only been documented in the latter (Linnell *et al.* 2018, entire; Moriarty *et al.* 2024a, entire). In American marten the proportion of females in the population declined over time as mature forest became scarce (Woollard *et al.* 2024, p. 13; Simons-Legaard *et al.* 2022).

Landscape scale: Landscape scale studies of coastal marten are not currently available, so we summarize new literature from other marten subspecies here. A study leveraging historical data and changes to the contemporary landscape showed American marten are capable of persisting within disturbed landscapes by shifting their habitat selection and spending more time in mature forest compared to availability, but as early-successional habitat increased in availability, marten increased their avoidance of this habitat (Woollard *et al.* 2024, pp. 11-13). Twenty-two Pacific marten in Lassen National Forest, California were collared and tracked to evaluate their movements within their home ranges and found movement was erratic and more linear in openings than in both complex and simple stands with avoidance of simplified stands (Freeman *et al.* 2025, pp. 8-9). While this study was focused on a smaller scale than the landscape scale it is likely that marten would exhibit similar behavior in fragmented landscapes. In British Columbia, Pacific marten in burned, and in some cases subsequently salvage-logged forests, showed responses based on burn severity and salvage logging. Marten selected areas less affected by fire up to 13 years after fire and strongly avoided salvage-

logged areas over all spatial scales measured (Volkmann and Hodges 2024, p. 9). Marten appear to use landscapes displaying a wide range of post-fire conditions, but salvage logging appears to significantly impede foraging and dispersal (Volkmann and Hodges 2021, entire; Collier 2024, entire).

Diet

Diet of coastal marten varies by season and population with several previous studies summarizing seasonal prey richness. A more recent study supported this information and revealed prey richness and diet diversity varied between sampling units distributed across the range of the coastal marten. Areas within the Coast Ranges had both lower diet diversity and taxonomic richness than areas sampled in the Oregon Dunes and Oregon Cascades perhaps due to sample size and extent. Birds were relatively more prominent prey items in the Oregon Dunes while voles, mice, and squirrels were more frequently consumed in all other areas. Regional diet patterns suggest that martens exhibit foraging plasticity, shifting their target species based on what is locally common and particularly when species richness and diversity are low (Martin *et al.* 2025, in review). Coastal marten are more likely to eat small mammals with increasing forest cover and decreasing edge density and conversely ate more birds when cover decreased and edge density increased (Martin *et al.* 2025, in review).

Threat Analysis

Current or potential future threats to coastal marten include timber harvest (Factor A), impacts from catastrophic wildfire (Factor E), disease and predation (Factor C), collisions with vehicles (Factor E), exposure to rodenticides (Factor E), and climate change (Factor A), all of which are exacerbated by the species' small and isolated populations (Factor E). These threats were evaluated in detail in the original SSA and any significant new information available since the 12-month finding is described below and in more detail in the updated SSA (Service 2026, in review).

Timber Harvest

Vegetative fuels have become abnormally abundant (mainly due to fire suppression and historical harvest practices) and increasingly flammable due to climate change-driven aridity. Fuel reduction frequently includes hand or mechanical thinning, pruning of ladder fuels, mastication, pile burning, and prescribed fire. These practices collectively aim to moderate the spread and severity of wildfires, often with overlapping goals of improving stand health (*e.g.*, reducing inter-tree competition) and resiliency to disease (Hood *et al.* 2016, entire). Despite recent initiatives to augment resources for fuel reduction, treatment rates have not been sufficient to curtail increases in wildfire (North *et al.* 2024, pp. 1–2). To address this the U.S. Forest Service (Forest Service) launched the Wildfire Crisis Strategy in 2022 to substantially increase fuel reduction efforts in the next decade across 21 "priority landscapes" in 10 western states (Forest Service 2023, entire; Woolsey *et al.* 2024, p. 335). Two of these landscapes, the Klamath River Basin Landscape and Trinity Forest Health and Fire Resilient Rural Communities Landscape, comprise a large portion of the coastal marten range. Under the Wildfire Crisis Strategy, the Forest Service plans to treat at least 217,000 out of 10 million acres (ac) (87,817 out of 4,046,856 hectares (ha)) in the Klamath River Basin priority landscape from 2023 to 2031, and at least 65,000 out of 910,000 ac in the Shasta-Trinity

National Forest priority landscape between 2023 and 2026 (Forest Service 2023, pp. 16, 22). In fiscal year 2024 alone, 176,282 ac (71,338 ha) in the Klamath River Basin priority landscape (81 percent of the goal and 1.7 percent of the landscape), and 24,836 ac (10,050 ha) in the Shasta-Trinity National Forest priority landscape were treated (38 percent of their goal and 2.7 percent of the landscape; Forest Service 2025 p. 10). For coastal marten, healthier stands with smaller, less intense fires would be beneficial; however, fuel reduction practices necessarily remove vegetative components of coastal marten habitat and generate disturbance. In one study of 17 collared animals focusing on thinned areas of federally managed forests, coastal marten avoided thinned areas and the proportion of their home range that overlapped these thinned units was on average less than 10 percent (Moriarty *et al.* 2024b, p. 17).

New information indicates logging in forests affected by fire is a significant threat to the coastal marten viability including recent studies that have shown that other populations of Pacific marten strongly avoid salvage-logged areas. For example, the ability of Pacific marten in British Columbia to persist on the landscape post-fire was tied to the quality of residual habitats, and salvage-logged areas were unsuitable to both marten and their prey due to low overhead cover and low structural complexity (Volkmann and Hodges 2021, p. 13). As a result, the animals rarely crossed habitats that had been salvage-logged, which lacked remnant trees and other structures essential to marten. In a similar study, Pacific marten selected burned areas with relatively high basal area and stand density index values, highlighting the importance of post-fire forest density, regardless of tree mortality (Collier 2024, p. 83). Incidentally, a study of collared coastal marten focused on fine-scale habitat use was ongoing when the Flat Fire ignited in Oregon. While the sample size is small (n=5), data from these animals indicated they strongly selected for unburned forests over areas burned at any severity but moved through and rested in areas burned at lower severity (Moriarty *et al.* 2024a, p. 5).

Further, the Service has previously relied on conservation protections within the Northwest Forest Plan in contemplating how existing regulatory mechanisms protect the coastal marten. The Service and Forest Service are currently engaged in amending the Northwest Forest Plan, and draft amendments suggest that the Forest Service is considering significant changes to permissible activities within Late Successional Reserves, which contain a substantial amount of currently occupied coastal marten habitat. Changes to allowed management activities in Late Successional Reserves, including increased management, are likely to impact coastal marten.

Disease and Predation

One new disease was documented to impact Pacific marten when an individual in the Cascade Range tested positive for highly pathogenic avian influenza and necropsy results indicated the individual died from exposure to this disease (Jackson 2023, pers. comm). Marten consume several avian prey items and could be exposed through consumption of contaminated prey. It is unclear how widespread exposure might be, what the consequences to individuals or populations would be, and there is no systematic testing of individuals underway.

Updated information is also available on the extent of bobcat presence across the range of the coastal marten based on systematic surveys which indicate coastal marten avoid areas occupied by fisher and bobcat, two predators of coastal marten (Anderson 2023, entire; Barry *et al.* in prep, entire).

Furthermore, analysis of nine carnivores in southern Oregon revealed that presence of bobcat and grey fox appeared to significantly impact whether coastal marten occupy a stand and two cases of bobcat preying on marten were confirmed via scat analysis (Barry *et al.,* in prep).

Trapping

Since the time of listing Oregon banned trapping of coastal marten and targeted trapping is no longer considered a threat. Incidental trapping could still impact individuals but there are a limited number of trappers operating within the range of coastal marten.

Vehicle Collisions

The threat of collisions with vehicles was analyzed in our 12-month finding and there have been additional roadkills documented in the past few years. One occurred near Gasquet, California during response to the 2023 Smith River Complex Wildfire. Fire personnel recovered this carcass and indicated that the two-lane county road was accessible only to fire personnel. Necropsy indicated that cause of death was most likely explained by vehicular collision and not exposure to fire or smoke. It is unclear if this individual was attempting to flee impacts from the fire or not. The other two roadkills occurred within 300 m of each other, on Newton B. Drury Parkway—a scenic byway within Redwood National Park, California. Redwood National Park has reduced the speed limit from 45 to 35 miles per hour. Overall, this threat is poorly understood as few roadkills are collected and most are likely consumed by scavengers or are not visible from the roadway after impact.

Rodenticide Exposure

Cannabis cultivation sites are common within the range of the coastal marten and have been associated with the use of anticoagulant rodenticides (AR). Recently two of five coastal marten tested positive for ARs, with one of the mortalities found to be directly caused by AR toxicosis (Martin *et al.* 2022, entire).

Additionally, Wengert and colleagues mapped the distribution of likely cannabis cultivation sites in forested regions of California and southern Oregon and then overlayed the cultivation site risk map with a map of the coastal marten's "core" habitats (Wengert *et al.* 2021, entire). Even without using a map of all suitable marten habitat, the study found that there was greater than 37 percent overlap of key habitat core areas with moderate or high cultivation site likelihood, indicating that the threat of ARs from trespass grows is "significant" across the range (Wengert *et al.* 2021, p. 9).

Lastly, during the Smith River Complex Burned Area Emergency Response (BAER) assessment, 43 previously undocumented illegal cannabis cultivation sites were discovered with 40 present in suitable coastal marten habitat and 80 percent containing banned pesticides. To date the Forest Service has not reclaimed these sites and exposure to ARs and other pesticides is likely ongoing. These sites would have likely remained undiscovered except for the post-fire response and represent a small portion of the sites located across the coastal marten range.

Wildfire

Fire frequency and extent has been increasing across the coastal marten range since the time of listing (Figure 2, Abatzoglou *et al.* 2021, entire). Increases in fire season length and the frequency of extreme fire weather has been observed globally, and in Pacific forests weather exerts significant control over the area burned each year with burned area increasing in tandem with significant increases in fire weather (Jones *et al.* 2022, p. 55). Overall recent fires have burned 2058 km^2 (1279 mi^2) or ~40 percent of the northern coastal California extant population area including the 2020 Slater Fire and the adjacent 2023 Smith River Complex that burned 635 km^2 (395 mi^2) and 385 km^2 (129 mi^2) respectively including previously documented marten denning sites. The Smith River Complex BAER report indicated that 15 percent burned at high severity and 34 percent burned at moderate severity.

An assessment of the Pacific marten's use of burned landscapes in Washington and British Columbia 0–13 years post-fire found that the species used a wide range of post-burn habitats, including in severely burned areas absent salvage logging, but selected areas that burned at low severity and were more similar to pre-fire conditions (Volkmann and Hodges 2021, p. 11). The animals were most active in areas with intact, residual trees and rarely used open meadows. They also adopted more direct routes through areas that burned at high severity and chose larger home ranges that excluded large patches of low-quality habitat, resulting in increased energy expenditures and overlapping home ranges between males, potentially as a result of being forced to share fragmented habitat (Volkmann and Hodges 2021, p. 11-13). The study did not find the same shift to directed movement through more recently burned areas, suggesting that long-term changes to the landscape have a stronger negative effect on the species than do short-term changes (Volkmann and Hodges 2021, p. 12).

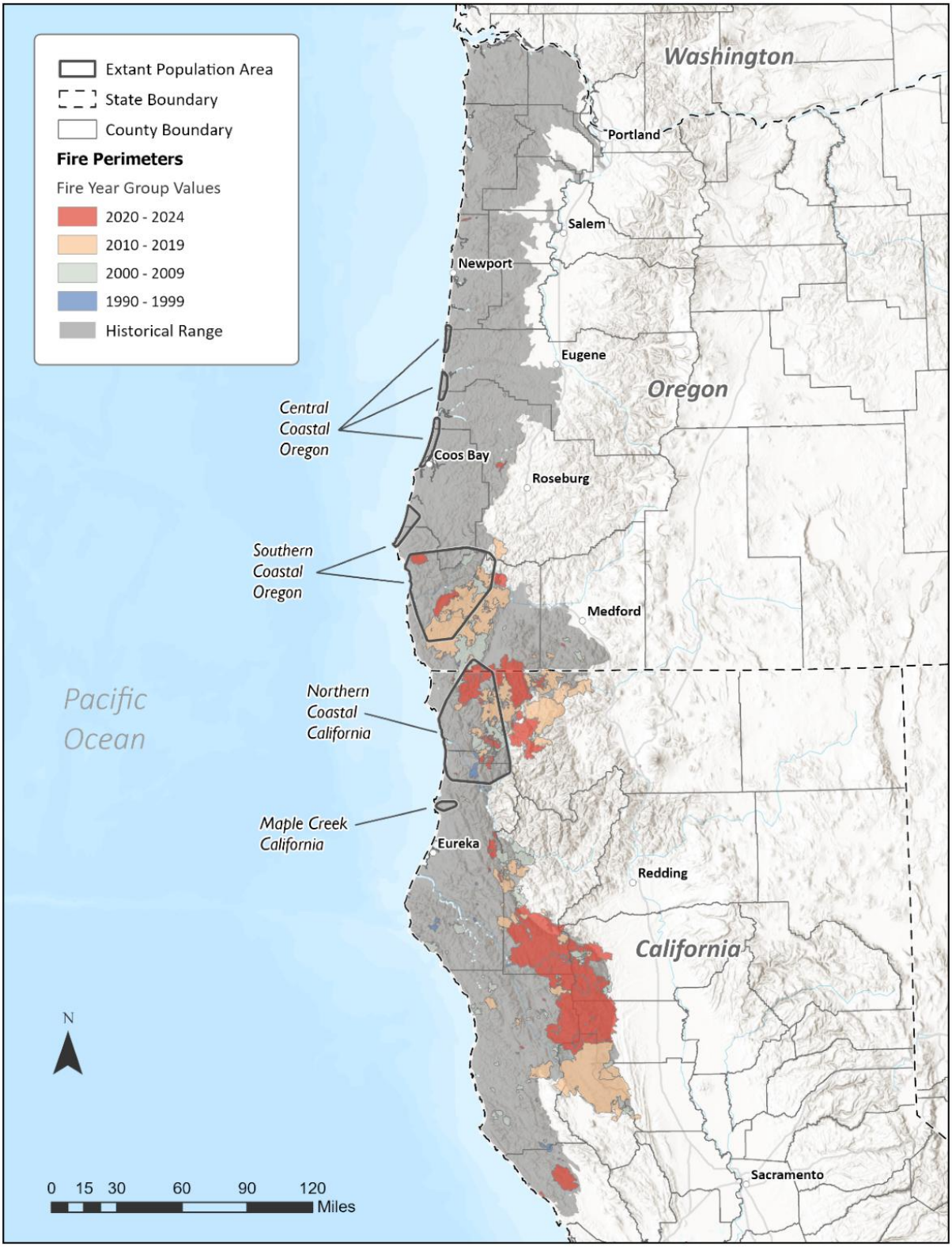

Figure 2. Fire history across the historical range of coastal marten showing increased rate and size of fires in recent years.

Climate Change

Species' response to climate change may affect aspects of their biology including population density, demography, and interspecific relationships (Wereszczuk *et al.* 2023, entire). Species that are already declining or have declined due to non-climate change-related pressures are likely to be more sensitive to the impacts of climate change. A recent global assessment of all Gulonidae (a subgroup of mustelids) indicates that Pacific marten have the highest vulnerability of all species analyzed to climate change impacts based on range, climate zones occupied, preferred habitat and threats to habitat, habitat specificity, and population trends (Birks *et al.* 2025, p. 15).

Small and Isolated Populations

As described above in the 'Biology' section there are recent genetic analyses that support our previous understanding that marten populations are isolated, especially in Oregon (Hallerud et al. in review). This information confirms what was previously assumed about isolation between populations and highlights the vulnerability of the three Central Coastal Oregon populations to stochastic and catastrophic events. In one example, decreasing occupancy combined with increased fragmentation, like coastal marten have already experienced, are associated with a higher risk of extinction under climate change scenarios (Pearson et al. 2014, entire). Linnell et al. (2018) analyzed population viability under various starting population sizes including the larger sizes we assumed in the 2015 12-month finding (80 FR 18742); we now understand these populations are functioning as demographically separate, smaller populations. Confirming that the populations are smaller, more isolated, and functioning separately than we previously understood means that extinction risk is higher than previously assumed in Oregon. A more recent study analyzing viability suggested that scenarios that started with fewer than 100 individuals resulted in a higher likelihood of extinction (Martin et al. 2022, supplemental). Conversely the two California populations described in the 2017 12-month finding have merged based on increased detections between the populations and we have identified a new, albeit small, population south of the large California population. This new population extends the currently occupied area further south than previously identified.

Evaluation of Recovery Criteria:

The recovery outline emphasizes filling knowledge gaps, protecting existing populations and suitable habitat, exploring feasibility of reintroductions, restoring habitat to suitable conditions and ameliorating primary threats (Service 2021, entire).

The recovery plan is in development and no finalized recovery criteria are currently available.

Conclusion:

After reviewing the best available scientific information, we conclude the coastal marten DPS of Pacific marten remains a threatened species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Endangered Species Act and assessment of the status in the 2020 12-month finding remains an accurate reflection of the species' current status.

RECOMMENDATIONS FOR FUTURE ACTIONS

The following conservation, research and management actions will aid in the recovery and conservation of coastal marten and are recommended based on this 5-year review:

1. Continue to coordinate with partners to conduct analysis of existing coastal marten data to determine trends and monitor population status and marten habitat use at multiple scales.
2. Conduct regular surveys in all extant population areas and adjacent areas with suitable habitat. Surveys should include estimates of abundance, spatial information, presence of threats, and general habitat conditions.
3. Publish, solicit and incorporate public comments, and finalize the recovery plan.
4. Develop techniques to spatially analyze marten habitat across the range and develop updated habitat suitability models that reflect the variety of habitats occupied.
5. Develop standardized monitoring protocols and data collection to facilitate implementing range-wide studies.
6. Collect data on the impacts of increased timber production, fuels reduction activities, and wildfire to coastal marten at both the individual and population levels.
7. Create management recommendations that align retention and recruitment of a dense, ericaceous shrub layer with wildfire community protection, fuels reduction, and timber production.
8. Continue to restore habitat for marten while considering restoration of habitat outside of extant population areas to encourage population expansion and connectivity.
9. Advance working relationships with partners to create a range-wide database of marten survey effort and detections to easily analyze range-wide trends and better assess the status of the species.
10. Continue to evaluate the feasibility of translocation especially focused on genetic rescue of central coastal populations in Oregon.

APPROVAL

Assistant Regional Director for Ecological Services, Pacific Southwest Region, U.S. Fish and Wildlife Service

Approve: ADAM JOHNSON

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REFERENCES

Abatzoglou, J.T., D.S. Battisti, A.P. Williams, W.D. Hansen, B.J. Harvey, and C.A. Kolden. 2021. Projected increases in western U.S. forest fire despite growing fuel constraints. Communications Earth & Environment 2:227.

Anderson, E. 2023. Sympatric carnivores and vegetation structure influence the distribution and abundance of Humboldt martens in northern California. Master's thesis. California State Polytechnic University, Humboldt, CA, USA. 89 pages.

Birks, J., S. Johnstone, E. Snell, & J. MacPherson. 2025. What is the future for The Martes Complex (Guloninae) in the face of climate change and ecological breakdown? Stacks Journal: 25006. https://doi.org/10.60102/stacks-25006

[Diversity Database] California Natural Diversity Database. 2025. State and Federally Listed Endangered, Threatened, and Rare Animals of California. California Department of Fish and Wildlife. Sacramento CA. January 2025. 37 pp.

Clark, T.W., E. Anderson, C. Douglas, and M. Strickland. 1987. *Martes americana*. Mammalian Species 289:1–8.

Collier, C. J. 2024. Fire severity mediates marten and fisher occurrence: Impacts of the Dixie Fire on a carnivore community. M.S. thesis, California Polytechnic University, Humboldt, Arcata, CA, USA.

Delheimer, M. S., K.M. Moriarty, H.L. Munro, D.A. Early, K.A. Hamm, & R.E. Green. 2023. Structural complexity characterizes fine-scale forest conditions used by Pacific martens. The Journal of Wildlife Management, 87(4), e22388.

Eriksson, C.E., K.M. Moriarty, M.A. Linnell, and T. Levi. 2019. Biotic factors influencing the unexpected distribution of Humboldt marten (Martes caurina humboldtensis) population in a young coastal forest. PLoS ONE 14(5): e021 4653. https://doi.org/10.1371/journal.pone.0214653.

Freeman, S., K.M. Moriarty, and J. Fieberg. 2025. Forest-thinning in marten habitat: summary of current results. On file with Arcata Fish and Wildlife Office, 11 pp.

Hallerud, M. A., K. M. Moriarty, K. Pilgrim, C. B. Quinn, C. Eriksson, M. K. Schwartz, and T. Levi. In review. Conservation genomics and noninvasive panel development for scat-based demographic and genetic monitoring of Humboldt martens.

Hood, S.M., S. Baker, and A. Sala. 2016. Fortifying the forest: thinning and burning increase resistance to a bark beetle outbreak and promote forest resilience. Ecological Applications 26: 1984–2000.

Jackson, D.H. 2023. Presentation during marten working group meeting on April 13, 2023. Subject: HPAI exposure in Cascade marten.

Jones, M. W., Abatzoglou, J. T., Veraverbeke, S., Andela, N., Lasslop, G., Forkel, M. 2022. Global and regional trends and drivers of fire under climate change. Reviews of Geophysics 60.

Martin, M.E., M.S. Delheimer, M.W. Gabriel, G.M. Wengert, and K.M. Moriarty. 2022. Combined field and clinical methods clarify mortality cause and survival patterns of Pacific martens. Journal of Wildlife Management: 1-15.

Martin, ME, M.S. Delheimer, A.M. Roddy, K.M. Moriarty, C.E. Eriksson, M.S. Gunther, J. Allen, J. Hartman, B.H. Smith, and T. Levi. 2025. *In final prep.* From coastlines to mountain crests – regional and continental variation in the diet and foraging patterns of North American martens.

Moriarty, K.M., M. Hallerud, T. Levi, J. Buskirk. 2024a. Final report for Recovery Challenge Fund grant F22AC00663: "Coastal marten ABC's: Addressing information gaps, building knowledge for management decisions, and creating tools for population level monitoring. On file with Arcata Fish and Wildlife Office. 26 pp.

Moriarty, K.M., M. Hallerud, T. Levi, J. Buskirk. 2024b. Final report for BLM Grant L21AC10384. On file with Arcata Fish and Wildlife Office. 59 pp.

North, M.P., S.M. Bisbing, D.L. Hankins, P.F. Hessburg, M.D. Hurteau, L.N. Kobziar, M.D. Meyer, A.E. Rhea, S.L. Stephens, and C.S. Stevens-Rumann. 2024. Strategic fire zones are essential to wildfire risk reduction in the Western United States. Fire Ecology 20: 50.

Pearson, R., Stanton, J., Shoemaker, K., M. Aiello-Lammens, P. Ersts, N. Horning, D. Fordham, C. Raxworthy, H. Ryu, J. McNees, and H Akcakaya. 2014. Life history and spatial traits predict extinction risk due to climate change. Nature Climate Change 4, 217–221. https://doi.org/10.1038/nclimate2113

Powell, R.A., S.W. Buskirk, and W.J. Zielinski. 2003. Fisher and Marten (*Martes pennanti* and *Martes americana*). Pages 635–649 in G. Feldhamer, B. Thompson, and J. Chapman, editors. Wild mammals of North America, 2nd Ed. Johns Hopkins University Press. Baltimore, MD, USA.

[Service] U.S. Fish and Wildlife Service. 2021. Recovery outline for coastal marten, DPS of the Pacific marten. Arcata Fish and Wildlife Office, Arcata, CA. 8 pp.

[Service] U.S. Fish and Wildlife Service. 2024. Endangered and Threatened Wildlife and Plants; Initiation of 5-year Status Reviews of 59 Pacific Southwest Species. October 16, 2024.

[Service] U.S. Fish and Wildlife Service. 2026. Species status assessment for the coastal marten (*Martes caurina*) Version 3.0. February 2026. 173 pp.

Smith, M. M., J. D. Erb, and J. N. Pauli. 2022. Seasonality drives the survival landscape of a recovering forest carnivore in a changing world. Proceedings of the Royal Society B: Biological Sciences 289: 10 pages.

[Forest Service] U.S. Department of Agriculture, Forest Service. 2023. Confronting the Wildfire Crisis: Expanding Efforts to Deliver on the Wildfire Crisis Strategy. U.S. Department of Agriculture, Forest Service, Northwest Region, Oregon. 35 pp.

[Forest Service] U.S Department of Agriculture, Forest Service. 2025. Confronting the wildfire crisis: Making a Difference. FS-1187h. U.S. Forest Service. 9 pp.

Wereszczuk, A., A. Fedotova, A. Marciszak, M. Popiołek, A. Zharova, & A. Zalewski. 2023. Various responses of pine marten morphology and demography to temporal climate changes and primary productivity. Journal of Zoology. 319 42-53.

Woollard, T. F., D. J. Harrison, E. M. Simons-Legaard, and K. E. Fagan. 2024. Functional responses in American marten habitat selection indicate cumulative effects of progressive habitat change. Ecosphere 15:e4715.

Woolsey, G.A., W.T. Tinkman, M.A. Battaglia, and C.M. Hoffman. 2024. Constraints on mechanical fuel reduction treatments in United States Forest Service Wildfire Crisis Strategy priority landscapes. Journal of Forestry 122: 335-351.

Volkman, Logan A. and Karen E. Hodges. 2021. Post-fire movement of Pacific marten (*Martes caurina*) depend on the severity of landscape change. Movement Ecology 9,49: 1-20.

Volkmann, L. A. and K.E. Hodges. 2024. Effects of burn severity and postfire salvage logging on carnivore communities in montane forests. Journal of Mammalogy, 14 pages.

Personal Communications

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