

California Bobcat Conservation and Management Plan DRAFT



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Authors and Acknowledgements

AUTHORS:

RACHEL ROBERTS, *Statewide Bobcat Coordinator and Author*
JOHN NETTLES, *former Environmental Scientist and Assistant Author*
ALEXANDRA AVRIN, *Environmental Scientist and Assistant Author*
KATHRYN OLSTAD, *former Scientific Aid and Assistant Author*

BOBCAT MANAGEMENT OVERSIGHT GROUP:

CHAD DIBBLE, *Deputy Director, Wildlife and Fisheries Division*
KEVIN THOMAS, *Deputy Director, Regional Operations*
ERIN CHAPPELL, *Bay Delta Regional Manager*
SCOTT GARDNER, *Wildlife Branch Chief*
GARRY KELLEY, *Wildlife Health Laboratory Manager*
PETER FIGURA, *Wildlife Diversity Program Manager*

TECHNICAL ADVISORY GROUP, REGIONAL MANAGERS, AND EDITORS:

ALEXANDER HEEREN, *Research Scientist III*
ASIA MURPHY, *Research Scientist III*
BRETT FURNAS, *Big Game Conservation Program Supervisor*
CHRISTINE THOMPSON, *South Coast Region Supervisor*
DANIEL GAMMONS, *Inland Deserts Region, Supervisor*
DAVID HACKER, *Central Region Supervisor*
DEANA CLIFFORD, *Senior Wildlife Veterinarian*
GREG MARTINELLI, *Bay Delta Region, Program Manager*
JASON LOMBARDI, *former Statewide Large Carnivore Research Coordinator*
LINDSEY RICH, *Senior Environmental Scientist, Supervisor*
MARIO KLIP, *Game and Connectivity Program Manager*
MATT MESHRIY, *Upland Game / Small Game Biologist*
MICHAEL BROWN, *Environmental Scientist*
MICHAEL BUCHALSKI, *Wildlife Genetics Research Lead*
RYAN BOURBOUR, *Senior Environmental Scientist, Specialist*
THOMAS CONNOR, *former Research Scientist III*

REGIONAL BOBCAT STAFF:

Jon Ewanyk, Lindsey Engelbert, Briget Rooney, Christina Scott, Alexia Hemphill, Kiana Hargreaves, Christina Winters, John Pulliam, Rebecca Carniello, Kevin Howells, Mairan Smith, Rudolph Mena, Liam Jasperse-Sjolander, Jessica Copeland, Ali Vakili, Bri Maddalena, Tanner Statham, Amelia Zuckerwise, Mackenzie Rich, Megan Senour, Krysten Martin, Shannon Forshee, Jon Weissman, Nick Bergeron, Ian Keith.

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Chapter 1. Introduction

The bobcat (*Lynx rufus*), one of North America's few spotted wild felines, can be found in nearly every terrestrial habitat in California. Bobcats have long been respected by Native American tribes for their hunting skills, were feared by some European settlers for their perceived supernatural powers, and sought after by many for their high quality, uniquely patterned pelts (Young 1958, Hanson 2007). Bobcat conservation and management and public attitudes toward bobcats in California have changed over time. These changes prompted the need for a statewide assessment of bobcat populations and the development of a bobcat conservation and management plan.

In 2019 the California Legislature passed Assembly Bill 1254 (AB 1254), which created Fish and Game Code Sections (FGC §) 4157 and 4158. The bill became effective January 1, 2020, and made it unlawful to hunt, trap, or otherwise take a bobcat in California. FGC § 4158 directed the California Department of Fish and Wildlife (CDFW) to develop a bobcat management plan to inform and coordinate management decisions about bobcat populations. Before the Fish and Game Commission (Commission) can open a bobcat hunting season in any area, FGC § 4157 requires it to adopt CDFW's bobcat management plan and to take several additional actions. FGC § 4157 and 4158 are as follows:

FGC § 4157:

(a) Upon appropriation of funds by the Legislature for purposes of this section, commencing January 1, 2025, the commission may open a bobcat hunting season in any area determined by the commission to require a hunt.

(b) Before opening a bobcat hunting season in any area, the commission shall do all of the following:

(1) Consider the potential impacts of a bobcat hunting season, including the effects on all of the following:

(A) Bobcat populations.

(B) Bobcats' wild prey.

(C) Disease abatement, including, but not limited to, hantavirus.

(D) The control of invasive species, especially nutria.

(2) Require the implementation of effective nonlethal management strategies to address public safety and livestock conflicts related to bobcats.

(3) Adopt the bobcat management plan developed by the department pursuant to Section 4158.

(4) Consider state residents' values with regard to the trophy hunting of bobcats.

(5) Assess the costs to the department and the commission associated with bobcat hunting, including the administrative, implementation, and enforcement costs.

(c) Consistent with the requirements of Section 3031 and pursuant to Sections 713 and 1050, the commission shall set hunting license fees and associated fees for

any subsequent seasons in which bobcat hunting is allowed, at the levels necessary to fully recover all the reasonable administrative and implementation costs of the department and the commission associated with the hunting of bobcats in the state.

(d) This section does not limit the ability of the department or the commission to impose additional requirements, restrictions, or prohibitions related to the take of bobcats.

FGC § 4158:

(a) Before opening a bobcat hunting season pursuant to Section 4157, the department, in consultation with other relevant state agencies, local governments, federal agencies, non-governmental organizations, landowners, and scientific entities, shall develop, upon appropriation by the Legislature, a bobcat management plan to inform and coordinate management decisions regarding bobcat populations. The bobcat management plan shall use credible science and utilize an ecosystem-based approach. The bobcat management plan shall be submitted by the department to the commission and the Legislature and shall include all the following:

(1) A current statewide bobcat population estimate based on the best available science.

(2) An assessment of the overall health of the statewide bobcat population.

(3) A comprehensive strategy to manage bobcat populations and their habitat throughout the state, including, but not limited to, an assessment of the effects of climate change, such as from drought and wildfires; rodenticides; and human development on the state's bobcats, the bobcats' prey, and the bobcats' habitats. The comprehensive strategy shall utilize the principles of adaptive management and incorporate recommendations for monitoring.

(4) An investigation of efficacious nonlethal solutions to prevent bobcat predation on livestock, primarily chickens or other domestic animals that the Department of Food and Agriculture deems needing widespread protection from bobcats.

(5) Recommendations for regulatory or statutory changes necessary to implement the bobcat management plan.

(b) A report to be submitted pursuant to this section shall be submitted in compliance with Section 9795 of the Government Code.

The Legislature provided funding to CDFW to implement a statewide bobcat research and assessment project (hereafter the "California Bobcat Project") and to develop California's first bobcat conservation and management plan (hereafter "the plan"). The results of the California Bobcat Project are presented in the [California Bobcat Population Monitoring - Report of Findings](#) (hereafter the "BPM Report"; CDFW 2026). Those results, as well as prior research and

management in California and elsewhere, form the basis of this plan, which includes the components specified in FGC § 4158.

1.1 Goals and Objectives

Consistent with FGC § 4158, CDFW established the following goals and objectives for the California Bobcat Project:

GOAL 1: Determine statewide bobcat population density and abundance.

Objective 1.1: Design and implement a bobcat population survey, using fecal DNA, remote camera surveys, and GPS-collar telemetry data, across numerous California ecoregions to better understand bobcat populations statewide.

Objective 1.2: Use the survey data from Objective 1.1 to model how bobcat density varies across different California ecoregions and habitats and better understand interspecies interactions through multi-species occupancy and abundance analysis.

Objective 1.3: Use the spatial density model to generate a robust statewide population estimate as well as estimates for smaller regions of management interest.

GOAL 2: Assess the overall health of the bobcat population in California.

Objective 2.1: Collect survey data using a design that can be periodically replicated to allow assessment of long-term population trends.

Objective 2.2: Collect biological samples to assess disease prevalence, toxicant exposure, and other health risks to bobcats.

Objective 2.3: Collect biological samples to evaluate genetic variation, genetic population structure, and gene flow among bobcats.

GOAL 3: Develop an adaptive conservation and management framework to address stressors on bobcat populations in California.

Objective 3.1: Use the statewide density model developed for Objective 1.2 and ecoregionally specific results, such as population estimates, to identify stressors and potential management actions as they pertain to factors such as climate change, catastrophic wildfires, drought, and human-driven habitat loss or fragmentation.

Objective 3.2: Use the results from Objective 1.2 to identify potential stressors and factors affecting survival for guidance of management actions as they pertain to statewide bobcat populations.

Objective 3.3: Develop an adaptive bobcat conservation and management plan, using an ecosystem-based approach, to inform future

conservation and management of bobcats, co-occurring species, and their habitats in California.

GOAL 4: Understand the efficacy of nonlethal solutions to mitigate bobcat depredation on domestic animals.

Objective 4.1: Analyze CDFW records of bobcat depredation and other conflict incidents to find patterns and trends related to bobcat depredation.

Objective 4.2: Compile other data and literature to investigate the efficacy of mitigation measures for reducing human-bobcat conflict and negative impacts on domestic animals.

Objective 4.3: Provide guidance and recommendations for nonlethal human-bobcat conflict mitigation solutions.

GOAL 5: Outline guiding principles, strategies, and adaptive management recommendations for the long-term monitoring and conservation of bobcats in California.

1.2 Plan Development and Outreach

In 2020, CDFW received funding to implement the key components of AB 1254. CDFW conducted the primary field and laboratory investigations for the statewide survey in 2021-2022 and conducted analyses and prepared the plan from 2023- 2025.

Within CDFW, an executive Bobcat Management Oversight Group (BOMOG) was set up to provide direction for project implementation, establish timelines for deliverables, and provide ongoing oversight of plan development. A Technical Advisory Group (TAG) was also established to provide scientific advice and include CDFW staff chosen for their relevant expertise and experience. Under the guidance of the BOMOG and the TAG, a team of 20 individuals were hired to plan and implement field surveys and assessments across California. Most of these staff had temporary positions and focused on conducting field investigations at 48 study areas statewide. Project coordinators then compiled and analyzed the data and developed this conservation and management plan.

As part of its planning process, CDFW notified 182 California Native American tribes of its intent to develop a bobcat conservation and management plan, hosted two tribal listening sessions, and will send an administrative draft of the plan to tribes for review. A Bobcat Working Group, consisting of members of the bobcat research and monitoring community from various organizations, land trusts, agencies, universities and the public, was set up to provide outside expertise and to guide CDFW's research and monitoring methods. Six experts from the bobcat research and modeling community provided an independent peer review of an administrative draft of the plan (see Acknowledgements above).

CDFW consulted with the California Department of Food and Agriculture (CDFA) to decide which domestic animals are most impacted by bobcats and used that input to guide the plan's recommendations for bobcat-specific human wildlife conflict issues. A public stakeholder meeting was held to obtain recommendations, opinions, and concerns for guidance of the bobcat management plan. Invited participants included state agencies, local governments, federal agencies, non-governmental organizations, landowners, and scientific entities. The recommendations from and concerns expressed by the public and these groups will be carefully considered throughout the development of a final California Bobcat Conservation and Management Plan.

1.3 Plan Structure

This plan includes pertinent information about bobcat biology, bobcat ecology, human bobcat interactions, potential impacts of climate change and habitat loss, historical bobcat management and related legislation, Tribal perspectives, and recommendations for future management strategies. The plan has been significantly informed by the findings of CDFW's California Bobcat Project, the results of which are found in the [BPM report](#) (CDFW 2026).

The tasks for the plan set forth in FGC § 4158, and the primary plan section in which they are addressed are as follows:

1. Population Estimate - A current statewide bobcat population estimate based on the best available science. [Chapter 3](#)
2. Population Health - An assessment of the overall health of the statewide bobcat population (e.g., population trend, disease, toxicant exposure, and genetics). [Chapter 4](#)
3. Management Strategy - A comprehensive strategy to manage bobcat populations and their habitat throughout the state, including, but not limited to, an assessment of the effects of climate change, such as from drought and wildfires; toxicants; and human development on the state's bobcats, the bobcats' prey, and the bobcats' habitats. [Chapter 8](#)
4. Bobcat and Human Conflict Solutions - An investigation of efficacious nonlethal solutions to prevent bobcat predation on livestock, primarily chickens or other domestic animals that the Department of Food and Agriculture deems needing widespread protection from bobcats. [Chapter 5](#)
5. Management Plan Implementation - Recommendations for regulatory or statutory changes necessary to implement the Bobcat Management Plan. [Chapter 8](#)

Chapter 2. Bobcat Biology and Ecology

2.1 Phylogeny and Taxonomy

The bobcat, *Lynx rufus*, is a member of the Felidae family and is the smallest of four species in the genus *Lynx* (Werdelin 1981, Kitchener et al. 2017). The bobcat, Canada lynx (*Lynx canadensis*), Eurasian lynx (*Lynx lynx*), and Iberian lynx (*Lynx pardinus*) diverged from a common ancestor, *Lynx issiodorensis*, around 3.2 million years ago (Boscaini et al. 2016, Lin et al. 2022). *Lynx rufus* historically includes 12 recognized subspecies (Young 1958, McCord and Cardoza 1982, Larivière and Walton 1997), but the subspecies classification is unreliable (Burbrink et al. 2022) and the differences between these groups are uncertain (Kitchener et al. 2017).

More in-depth analysis recognizes two distinct groups of bobcats that were apparently separated by geological processes in the Pleistocene (Croteau 2009, Reding 2011, Loveless et al. 2016). *Lynx rufus rufus* was found east of the Great Plains and *Lynx rufus fasciatus* lived west of the Great Plains (Reding et al. 2012, Kitchener et al. 2017). The divergence of the eastern and western subspecies is thought to be a product of complex patterns of environmental processes and aridification during the warmer interglacial periods of the Pleistocene (Reding et al. 2012, Loveless et al. 2016). Additionally, current climatic conditions driven by precipitation differences between the dry western regions and the moist eastern regions (Reding et al. 2012), anthropogenic influences, (e.g., habitat loss and extirpation), and barriers between populations (Smith et al. 2020), may continue to genetically and spatially isolate the two subspecies (Loveless et al. 2016).

2.2 Distribution

Bobcats range from southern Canada to central Mexico, including most of the continental United States (Koehler 1987). Bobcats were thought to be extirpated in the early 1900s from several states in the Midwest, including Delaware, Iowa, Illinois, Indiana, Ohio, and Missouri, but they have since recolonized these areas and show increasing population trends (Larivière and Walton 1997, Roberts and Crimmins 2010).

Bobcats can be found throughout much of California. CDFW's California bobcat range map (Figure 1; California Department of Fish and Wildlife 2024a) shows the generalized geographic area within which bobcats could occur, but without consideration of anthropogenic infrastructure such as cities and roads, or of specific vegetation types that bobcats inhabit. More specific details about where bobcats are found in California are presented in Section 3.2.

California Wildlife Habitat Relationships System

California Department of Fish and Wildlife

California Interagency Wildlife Task Group

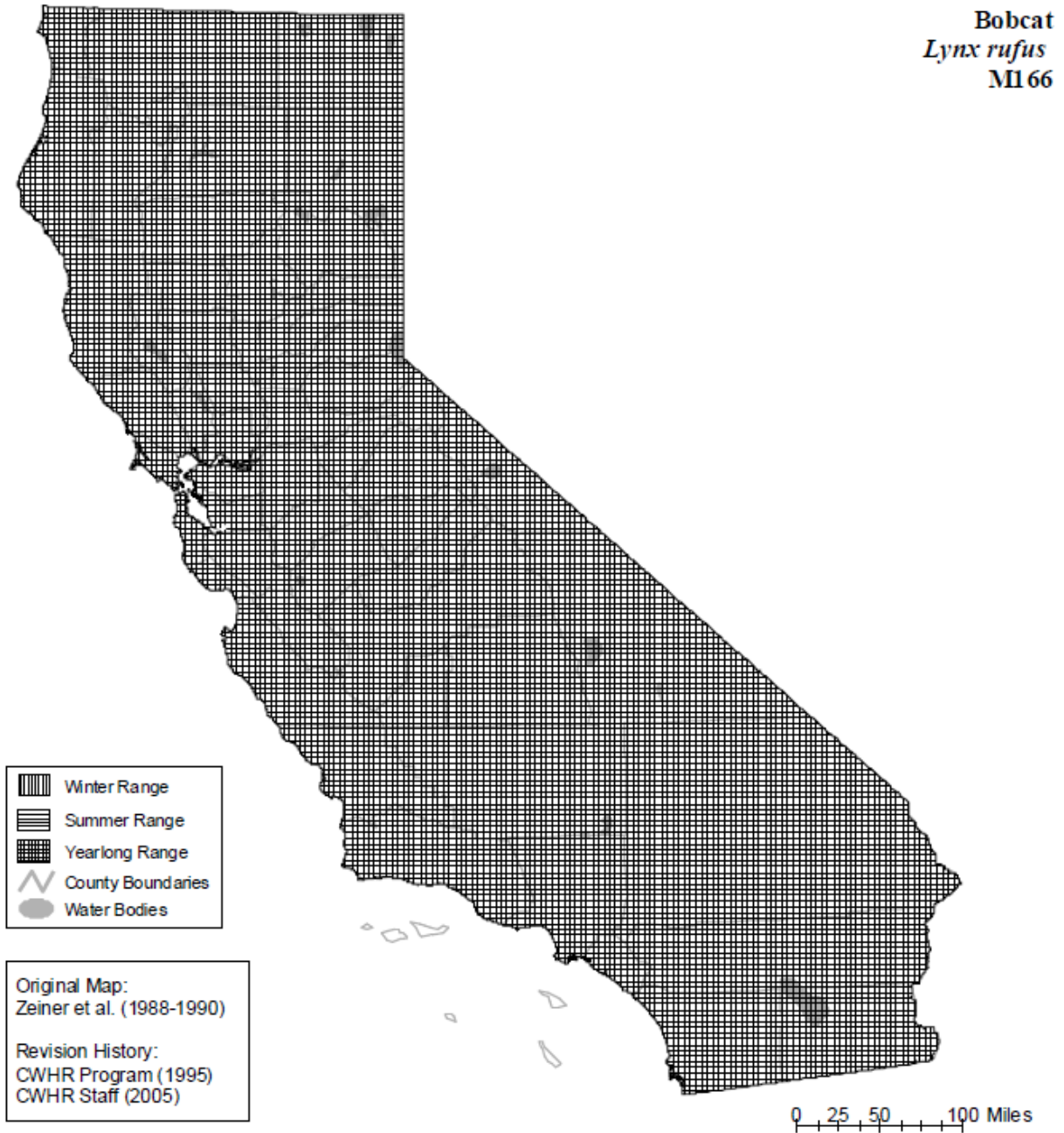


Figure 1: Bobcat range map is the generalized geographic area within which bobcats can occur without consideration of specific habitats that bobcats use. This range map includes the polygon bounding the geographic extent over

which bobcats are known to occur in California (California Department of Fish and Wildlife, Biogeographic Data Branch).

Note:

- *Range maps do not provide information about habitat use or probability of occurrence within the range.*
- *Range maps are likely to include areas where bobcats do not regularly occur but may move through.*
- *Range maps are likely to include unsuitable habitat as well as occupied and unoccupied suitable habitat.*
- *Commission error (mapping areas not occupied by bobcats) is prioritized in range maps over omission error (missing part of a bobcats' range).*
- *Range maps indicate the area where bobcats may occur and can therefore be used to determine where bobcats may need to be considered for conservation, or to guide where surveys for bobcats should be conducted*

2.3 Physical Characteristics

Bobcats are sexually dimorphic, with males outweighing females (Litvaitis et al. 1984, Anderson 1988, Dobson and Wigginton 1996). Adult males range from 5.8kg (Wengert personal comm., 2026) to 18.3kg (12.8 to 40.2lbs.) and adult females range from 4.1kg to 15.3kg (9 to 33.6lbs.; Young 1958, Lovallo and Anderson 1996, Larivière and Walton 1997). Body mass for both sexes increases with latitude and elevation, due to higher thermoregulatory needs and seasonality of food abundance, where bobcats that eat more during the warmer and more productive seasons have a greater chance of surviving the harsher cold seasons when less food is available (Sikes and Kennedy 1992, Wigginton and Dobson 1999). Bobcats in the wild can live up to 16 years (Knick et al. 1985, Anderson and Lovallo 2003), and in captivity, the oldest known bobcat lived to be a little over 32 years (Anderson and Lovallo 2003).

Bobcat fur, or pelage, typically have complex coloration and patterns that can vary depending on where they live. Their dense and short fur has a light gray to reddish-brown undercoat on the back and sides, with white to cream base color on the belly and insides of the legs. The topcoat has a unique pattern of dark spots or bands that can be especially prominent on the insides of the legs, and they often have bands of dark guard hairs that run down both sides of the spine along the back. These patterns vary greatly and are sometimes muted and mottled, blending in with the undercoat (Larivière and Walton 1997, Lovallo 2000). The undercoat of the inner legs is light in relation to the body, with dark spots that can often appear as horizontal black stripes (McCord and Cardoza 1982, Larivière and Walton 1997). The spot patterns, especially those on the legs, can be used as an individual identifier, as each bobcat has unique markings (Heilbrun et al. 2003). Bobcats have a black striped forehead and facial ruffs, and the color of their nose, pads, and whiskers vary (Larivière and Walton 1997). The back side of the ears have black fur with a central white spot, and the tip of each ear has a tuft of hair, which is thought to help detect sound vibrations and increase hearing

accuracy (Young 1958, Lovallo 2000). The characteristic bobbed tail is typically barred and 5-18 cm (2-7 in) in length (Koehler 1987, Banfield 1987, Larivière and Walton 1997, Lovallo 2000).

Seasonality impacts bobcat appearance as they rely on pelage for camouflage and protection against a wide range of climatic conditions (Young 1958). Habitat differences influence pelage similarly to season. Fur is typically buff and short in deserts, thick and gray in high elevation ranges, and dark with pronounced spots in mesic forests. Summer pelage is often short and buff with pronounced spots. Conversely, the winter pelage is long, thick, and gray toned, making the pelt more valuable to trappers (Rollings 1945). Bobcats with minimal seasonality in their environment have less pelage variation throughout the year (Branney et al. 2024).

2.4 Reproduction

Bobcats are solitary carnivores with a polygamous mating system and often have several mates over their lifetime (Duke 1954, Young 1958, Crowe 1975, Ferguson et al. 2009). year. Breeding occurs between January and March, but females can ovulate spontaneously and have multiple estrous cycles per year (Crowe 1975, Fritts and Sealander 1978, Stys and Leopold 1993, Anderson and Lovallo 2003). Reproductive timing and success can be affected by location (latitude), elevation, climatic variation, and prey availability (Crowe 1975, McCord and Cordoza 1982, Larivière and Walton 1997, Allen et al. 2015).

The estrus cycle lasts about 44 days for bobcats (Crowe 1995), with females experiencing the first estrus cycle around 9-12 months of age, while males are not reproductively active for two years (Crowe 1975, Anderson and Lovallo 2003). The gestation period lasts between 66 and 62 days depending on the timing of the first and last copulation, and birth occurs between March and May (Young 1958, Ewer 1973, Crowe 1975, Hemmer 1976, Stys and Leopold 1993). Bobcats have one litter per year but if the first litter is lost, they can have a second, although it is rare (Winegarner and Winegarner 1982). Litter sizes range from 1-6 kittens depending on geographical location and maternal age, with an average of 2-3 kittens (Knick et al. 1985, Larivière and Walton 1997). The lactation period is approximately 60 days, but kittens stay dependent on their mother after nursing ceases (Young 1958, Crowe 1975, Bailey 1972, Larivière and Walton 1997, Moriarty and Riley 2011). The survival of kittens is dependent on availability of food and predation risk (Bailey 1974, Koehler 1987). Females raise kittens on their own, until young disperse 9-12 months after weaning (Bailey 1974). Juveniles typically disperse before the next litter arrives (Winegarner and Winegarner 1982).

2.5 Food Habits

Bobcats are obligate carnivores due to the inability of their liver to process vegetable proteins efficiently and their inability to convert beta-carotene into vitamin A, an important vitamin for successful egg implantation and reproduction

(Scott 1968, Anderson and Lovallo 2003, Hansen 2007). Vitamin A must therefore be obtained from the organs of their prey. Although their digestive systems are less efficient at digesting plant materials than other carnivores, they are more efficient at digesting protein, bones, and hair (Johnson and Aldred 1982, Hansen 2007).

Bobcats are generalists and will eat any prey they can capture, and they commonly switch between prey species depending on the cycles of abundance (Bailey 1974, Leopold and Krausman 1986, Beattie 2020). Bobcats prefer to consume fresh prey when they capture it, but they occasionally scavenge, including from mountain lion (*Puma concolor*) kill sites (Allen et al. 2014), which can be risky if the mountain lion is protecting its cache (Koehler and Hornocker 1991).

While primary prey items likely differ regionally, bobcat diets typically include: large rodents such as wood rats (*Neotoma* spp.), cotton rats (*Sigmodon* spp.), and squirrels (*Sciuridae* spp.), rabbits (*Sylvilagus* spp.) and hares (*Lepus* spp.), and various bird species including quail (*Oreortyx*, *Colinus*, and *Callipepla* spp.), grouse (*Bonasa* spp.), doves (*Zenaida* spp.), turkeys (*Meleagris* spp.), crows and ravens (*Corvus* spp.), jays (*Cyanocitta* spp.), and numerous passerines (Larivière and Walton 1997, Neale and Sacks 2001, Tewes et al. 2002, Godbois et al. 2003, Hass 2009). Bobcats also consume pocket gophers (*Thomomys* spp.), mice (*Peromyscus*, *Reithrodontomys*, and *Chaetodipus* spp.), voles (*Microtus* spp.), and chipmunks (*Neotamias* spp.; Rollings 1945, Bailey 1974 and 1979, Knick et al. 1984, Maehr and Brady 1986, Dibello et al. 1990, Knick 1990, Larivière and Walton 1997, Fedriani et al. 2000, Thornton et al. 2004, Hass 2009, Rose and Prange 2015, Witczuk et al. 2015). Less common prey items include bats (*Chiroptera* spp.; Wroe and Wroe 1982), juvenile deer or fawns (*Odocoileus* spp.; Matson 1948, Knick et al. 1984, Hass 2009, Rose and Prange 2015, Witczuk et al. 2015), mountain beavers (*Aplodontia rufa*; Knick et al. 1984, Witczuk et al. 2015), porcupines (*Erethizon dorsatum*; Rollings 1945), marmots (*Marmota* spp; Witczuk et al. 2015), opossums (*Didelphis marsupialis*; Jackson 1961, Rose and Prange 2015), various amphibians (including *Rana* spp.; Smith et al. 2018) and reptiles such as lizards and snakes (Towell and Anthony 1988, Neale and Sacks 2001, Tewes et al. 2002, Blankenship et al. 2006, Hass 2009). Although bobcats are opportunistic hunters and will eat any of the species listed above, rabbits and hares are said to be an important staple of their diet when they are available (Anderson and Lovallo 2003).

In California, bobcats' primary mammalian prey include desert cottontail (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus bachmani*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), kangaroo rat (*Dipodomys* spp.), Botta's pocket gopher (*Thomomys bottae*), California vole (*Microtus californicus*), Western harvest mouse (*Reithrodontomys megalotis*), and deer mice (*Peromyscus* spp.), California pocket mouse (*Chaetodipus californicus*), and

juvenile mule deer or fawns (*Odocoileus hemionus*; Riley et al. 2010, Neale and Sacks 2001). Avian prey species include California quail (*Callipepla californica*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), and Steller's jay (*Cyanocitta stelleri*; Larivière and Walton 1997, Neale and Sacks 2001, Hass 2009).

Bobcats are also known to prey on domestic animals (see Chapter 5) such as chickens, turkeys, ducks, geese, swans (Gashwiler et al. 1960, Pearson and Caroline 1981), sheep, goats (Young 1958, Gashwiler et al. 1960, Altman 1997), small pets (Pollack 1951, Billodeaux 2007) and rarely, calves (Fritts and Sealander 1978, Wildlife Services 1996-2001).

While bobcats occur in diverse native habitats, they can also be found in and near human developments, including rural, exurban, suburban, and even urban areas, where they sometimes feed on species often considered to be pests, including rats, mice, squirrels, woodrats, rabbits, and pocket gophers (Morzillo and Schwartz 2011, Moriarty et al. 2012, Beattie 2020). Anthropogenic food sources such as garbage, compost, ornamental fruit, and bird feeders are not food attractants for bobcats (Beattie 2020) but do attract other prey species, which in turn could attract bobcats (Dunagan 2015). Rabbit densities can be greater in urban areas with lawns, gardens, and edge habitats than in native habitats, especially in dry Mediterranean climates like California, which may attract bobcats to these landscapes (Dunagan et al. 2019, Beattie 2020). In such a case, bobcats are potentially benefiting from a secondary urban subsidy, as their prey is benefiting from urban vegetation (sensu Dunagan et al. 2019).

2.6 Behavior

Bobcats are solitary, apart from young with their mothers (Marston 1942), males travelling with females in mating season (Saunders 1963), and when females, specifically mother-daughter pairs, exhibit resource sharing and home range overlap (Ray et al. 2017, Payne et al. 2025).

Bobcats display cathemeral activity, meaning they are active at irregular intervals during the day and night (Flores-Morales et al. 2019) which typically coincide with prey activity or the avoidance of competitors or human activity (Riley et al. 2003, George and Crooks 2006, Young et al. 2019). Bobcats have multiple resting sites across their home range on steep slopes, among rocks and bushes, or in sites like abandoned burrows, trees, hollow logs or under tree stumps (Rollings 1945, Bailey 1974, Banfield 1974, Anderson 1990).

Bobcats are expert climbers and jumpers, with the ability to leap more than eight feet (Rollings 1945, Hall 1981). They have exceptional eyesight and typically employ an ambush hunting style where they stalk in a crouch and sit in waiting, often observing their prey before leaping for the capture. If prey is not captured in the first effort, the chase is usually abandoned (Rollings 1945). They also use their keen hearing, climb up to high vantage points, and hunt from game trails to stalk

their prey (Rollings 1945, Anderson 1987, Marston 1942, Matson 1948). When necessary, bobcats can swim, but they typically avoid entering water and instead seek dry places to cross streams (Hall 1981). When pursued, particularly by dogs, bobcats have been known to swim across bodies of water to escape (Young 1958).

Despite being quiet and elusive, dwelling in the shadows as an ambush hunter (Hansen 2007), bobcats produce a variety of noises. Mating season and threatening situations can induce loud calls, deep growls, hisses, and spitting noises (Rollings 1945, Young 1958, Jackson 1961). If pursued, bobcats will hide in nearby rock outcroppings or trees to escape (Provost et al. 1973), and if cornered, they can become aggressive (Young 1958). Bobcats also show sunning behavior, seeking out south-facing slopes, especially during winter months (Reed et al. 2017). Tree clawing is used to stretch muscles, sharpen claws, and potentially as a territorial marker (Rollings 1945, Hall 1981).

Like most other felids, bobcats use scent marking for both territorial maintenance and courtship (Kleiman and Eisenberg 1973, Bailey 1974, Verberne and Leyhausen 1976, Mellen 1993, Logan and Sweanor 2001, Allen et al. 2015). Scent marking may be important for outlining the boundary of a bobcat's home range, signaling to other bobcats that the area is occupied (Ferguson et al. 2009). Scent marking is also important for intraspecies communication, especially during mating season (Wassmer et al. 1988, Allen et al. 2015). Methods of scent marking include fecal deposition, urine spraying, scrapes, anal gland expression, claw marking, and body rubbing (Bailey 1974, Allen et al. 2015). Adult bobcats are known to leave uncovered feces along their travel paths, as well as near resting sites, in caves, and in rocky outcroppings (Bailey 1974, Allen et al. 2015). Kittens do not seem to scent mark, and it is thought that juveniles begin showing scent marking behaviors at five months of age (Bailey 1974, Wassmer et al. 1988, Allen et al. 2015).

2.7 Habitat

Bobcats occur in a wide variety of habitats across much of the United States, southern Canada, and Mexico (Hall 1981, Koehler 1987, Hunter 2015). There is an estimated 8,708,888 km² of suitable bobcat habitat across their range (Mexico, Canada, and the United States), 6,186,819 km² (71%) of which is in the United States (Roberts and Crimmins 2010). They occupy shrublands, grasslands, deserts, semi-arid environments, coastal marshes, swamps, multiple forest types (tropical, boreal, coniferous, mixed, and hardwood), montane habitats, and some agricultural areas (pasture, hay, and cultivated crops such as corn, orchards and vineyards; Rollings 1945, Chamberlain et al. 2003, Thornton et al. 2004, Abouelezz et al. 2018, Espinosa-Flores et al. 2022, Sergeev et al. 2023). In California, bobcats occupy many habitats, including shrublands, oak woodlands, riparian zones, chaparral, forests, grasslands, deserts, and urban edges (Riley et al. 2003, Ordeñana et al. 2010, Ruell et al. 2012). They often select habitat edges, which typically provide a variety of prey, cover, and vegetation for stalking and denning

(Anderson and Lovallo 2003, Woolf 2002, Preuss and Gehring 2007, Jones et al. 2022). When available, bobcats typically select habitat with high structural diversity, such as rocky outcroppings, mixed to dense vegetation, forest and grassland edges, creek drainages, and the various habitats that surround waterways and wetlands (Rollings 1945, Lawhead 1984, Broman et al. 2014, Young et al. 2019, Hansen 2007, Reed et al. 2017, Abouelezz et al. 2018, Sergeyev et al. 2023a). Rocky outcroppings provide cover from predators, lookout points for hunting opportunities, and natal den sites for females (Hansen 2007, Abouelezz et al. 2018).

Bobcats sometimes seasonally shift habitat use, due to prey abundance, climate, and reproductive behavior (Rolley 1985, Koehler and Hornocker 1989, Chamberlain et al. 2003, Sergeyev et al. 2023b). Bobcats may shift prey choice from small mammals in summer to larger prey in winter, when the availability of small mammals often declines. If prey habitat use varies (e.g., temporal patterns and seasonality), bobcat habitat use can also shift (Lovallo and Anderson 1996, Chamberlain et al. 2003). Seasonal and climatic differences may also drive elevational choice. While bobcats occupy low to mid elevations, they also use higher elevations, especially in warmer, dryer climates. For example, bobcats have been recorded at 2,743 meters (8,999 feet) in Arizona (Hansen 2007), and 3,500 meters (11,482 feet) in western Mexico (Burton et al. 2003). Bobcat habitat choice is also influenced by snow conditions, with bobcats selecting for lower elevations and south-southwest facing slopes when snow is present (Koehler and Hornocker 1989, McCord 1974, Larivière and Walton 1997).

Although bobcats appear to select areas with few roads and limited human development, they have shown adaptability to human-altered landscapes, including urban and suburban areas (Riley et al. 2003, Ordeñana et al. 2010, Young et al. 2019). Bobcats can use fragmented habitats and urban areas that include habitat elements providing cover and prey (Crooks 2002, Tigas et al. 2002, Broman et al. 2014, Lombardi et al. 2017, Schmidt et al. 2023, Mayer et al. 2022). However, without adequate habitat connectivity in such areas, bobcat movement and survival can be adversely impacted (Riley et al. 2003, Poessel et al. 2014). Connectivity between habitat areas allows for dispersal, gene flow (Riley et al. 2006, Smith et al. 2020), and access to resources (Crooks 2002, Ruell et al. 2012, Poessel et al. 2014).

Male bobcats are more commonly associated with urban and natural habitat transition zones than females, perhaps due to perceptions by females that areas modified and occupied by humans as less safe for raising young (Riley et al. 2003). Further, because males often widely search for potential mating opportunities, they may be more willing to move through urban interfaces (Connor et al. 1999, Riley et al. 2003). Bobcats using urban transition zones tend to seek out riparian corridors or more natural areas of connectivity, which provide cover for movement and may sometimes have higher prey densities (Young et al. 2019).

While bobcats sometimes take the easiest path and travel roads through urban areas (McCord 1974, Wengert 2013), this risky behavior can lead to death by vehicular strike (Tigas et al. 2002, Riley et al. 2003, Anderson 2023; See Chapter 3.11).

Bobcat use of agricultural areas such as pastures, orchards, and vineyards is variable (Lesmeister et al. 2015, Flores-Morales et al. 2019, Young et al. 2019) and is influenced by the quality of surrounding habitat and the type and size of agricultural operation. For example, bobcats often avoid cattle farming and row crops (Bradley and Fagre 1988, Duran-Antonio et al. 2020, Serieys et al. 2021), which often have vegetation structure unfavorable to bobcats (Yates et al. 2000, Flores-Morales et al. 2019). Flores-Morales et al. (2019) found that bobcats typically avoid large agricultural areas (>100km²), while Young et al. (2019) reported bobcats using natural and agricultural lands in their study area. Flores-Morales et al. (2019) saw bobcats more often in firewood extraction sites compared to grazing areas, with no observations in croplands. These differing reports are likely due to the studies being conducted on a wildland population (La Malinche National Park, Mexico; Flores-Morales et al. 2019) and an urban population (Dallas Fort Worth metroplex, Texas; Young et al. 2019). Urban bobcats have less available habitat to choose from, so they may opt for agricultural lands over areas with greater human activity. However, Serieys et al. (2021) found that even close to and in urban areas, bobcats avoided both low-lying row crops and orchards. Wildland bobcats, conversely, have more suitable habitat surrounding the agricultural areas, with little to no human activity, which they may use more often over the modified agricultural landscape.

2.8 Home Range Characteristics, and Movements

Bobcat home range sizes vary across the species' range (Anderson and Lovallo 2003, Ferguson et al. 2009) and are influenced by factors such as prey resources (Bailey 1974, Anderson and Lovallo 2003), population density (Benson et al. 2004, Riley et al. 2010), and habitat quality (Rucker et al. 1986). Caution is warranted when comparing home range characteristics across studies as variations in the number of bobcats tracked, the number of radiotelemetry locations used, the season of sampling, and the technique used to estimate home range size can all confound comparisons (Anderson and Lovallo 2003, Hansen 2007, Riley et al. 2010).

Although bobcat home range sizes vary, some characteristics are typically consistent. The main pattern across multiple studies is that males have larger home ranges than females (Litvaitis et al. 1987, Lovallo and Anderson 1996, Cochrane et al. 2006, Hansen 2007, Ferguson et al. 2009). Female bobcat home range size is thought to be more influenced by food availability than males; and females, across their range, may increase home range size in winter due to decreased prey availability (Maehr and Brady 1986, Knick 1990, Lovallo and Anderson 1996, Cochrane et al. 2006, Ferguson et al. 2009). Females will

conversely decrease their home range size during kitten season when they are spending most of their time caring for young (Litvaitis et al. 1987, Anderson and Lovallo 2003). Male home range sizes also vary seasonally with more space being used during mating season when males range more widely as they follow movement patterns of multiple females in search of maximizing mating opportunities (Lembeck 1978, Anderson and Lovallo 2003, Cochrane et al. 2006, Ferguson et al. 2009).

Studies from across their range (Table 4) show the average size of a female bobcat home range is 15.7 km² (Ferguson et al. 2009), with a range of 0.99 km² (Ferguson et al. 2009) to 69.7 km² (Knick 1990). The average size of a male home range is 39.6 km² (Ferguson et al. 2009), with a range of 2.6 km² (Miller and Speake 1979) to 167.9 km² (Major 1983). These studies used a variety of methods, some of which likely overestimated home range sizes. Results from the California Bobcat Project showed female bobcat home ranges averaged of 13.3 km² and were as small as 1.3 km² and as large as 36.6 km². Male bobcat home ranges averaged 28.1 km² and ranged from 6.4 km² to 93.4 km².

Table 1: Smallest, largest, and average bobcat home range size (km²) from the literature (Bailey 1974, Miller and Speake 1979, Litvaitis et al. 1987, Lovallo 2000, Ferguson et al. 2009, Payne et al. 2025) and from the California Bobcat Project.

	Smallest	Largest	Average
Female bobcats from literature	0.99	69.7	15.7
Female bobcats from CDFW study	1.3	36.6	13.6
Male bobcats from literature	2.6	167.9	39.6
Male bobcats from CDFW study	5.4	93.4	29.1

Seasonality (winter/wet - Dec-Feb; kitten - March-May; summer/dry - June-Nov) did not have a significant effect on the size of male or female bobcat home ranges from the California Bobcat Project, although male home ranges were significantly larger than female home ranges in both the winter/wet season and kitten season. For more detailed discussion on bobcat home range results from the California Bobcat Project, see [BPM report](#), Sections 3.7, 4.6, & 5.6.

Although not well documented, elevation may affect bobcat home range size. At higher elevations, harsher temperatures and weather conditions may make survival more difficult for some animals, requiring them to travel farther to find the food resources they need and leading to larger home ranges and fewer individuals. Population density is also associated with home range size, with larger home range sizes in areas with lower bobcat density (Anderson and Lovallo 2003).

The California Bobcat Project found that elevation and bobcat population density had significant associations with home range size ([BPM report](#), Section 4.6). At higher elevations, the density of bobcats declined, and their home range sizes were larger. At lower elevations, the population density was higher, and

bobcat home range sizes were smaller, as more individuals used the available space ([BMP report](#), Section 5.6).

Similarly, latitude can affect bobcat home range size, where bobcats in higher latitudes have larger home ranges than those in southern (Anderson and Lovallo 2003). Northern bobcats have been found to be larger in stature, likely to deal with the physical demands of a colder climate and may need to search farther for prey during harsh winter conditions (Anderson and Lovallo 2003). However, latitude did not influence the home range size of bobcats studied in the California Bobcat Project.

Human development affects bobcat home range sizes, with bobcats in rural areas typically having larger home ranges than in urban areas because of fewer barriers to movement and less competition for territory and resources (Riley et al. 2010). Bobcats living closer to urban areas tend to select against development within their home ranges. As human development increases, bobcat densities on the edges of development or within smaller habitat patches increase (Young et al. 2019, Schmidt et al. 2023), which can lead to smaller home ranges and more home range overlap, especially among females (Riley et al. 2006, Ordeñana et al. 2010, Riley et al. 2010, Lewis et al. 2015, Lombardi et al. 2017, Schmidt et al. 2023). This is due to habitat patches in developed areas being isolated from larger wildland habitat areas and often bounded by movement barriers (e.g., highways), which can limit dispersal and cause home range pile-up (Riley et al. 2006, Poessel et al. 2014, Schmidt et al. 2023). Although uncommon, lethal fights between males over territory have been observed (Anderson and Lovallo 2003, Benson et al. 2004, Ferguson et al. 2009).

The home ranges of male and female bobcats commonly overlap so that breeding opportunities can be maximized (Anderson and Lovallo 2003). Home range overlap among the sexes is also common and can be influenced by factors such as population density (Zezulak 1980) and habitat availability, especially in urban areas where space and food resources are limited (Riley 2006, Riley et al. 2010, Young et al. 2019, Schmidt et al. 2023). Kinship may also play a role in home range overlap and the degree of tolerance between bobcats, specifically between females of the same family. Some studies using a combination of genetic data and GPS location data (Janecka et al. 2006, Payne et al. 2025) have shown that mother-daughter home range overlaps are more common than previously thought.

Finally, daily movement patterns and travel distances differ between sexes (Bailey 1974, Kitchings and Story 1984, Hansen 2007) and may depend on the size of the animal's home range and differences in feeding habits (Anderson and Lovallo 2003). Males travel between 1.8 to 4.9 km per day, while females average 1.2 km per day (Bailey 1974, Kitchings and Story 1979, Anderson and Lovallo 2003). The California Bobcat Project found that average daily path distance was 2.9 km for collared females and 3.8 km for males. The longest distance calculated between

778 GPS locations from a 24-hour period was 14.4 km for a female and 21.5 km for a
779 male (see [BPM report](#), Sections 4.6 & 5.6).

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Chapter 3. Population Status and Ecology

3.1 Bobcat Genomics Project

The California Conservation Genomics Project (CCGP), including collaborators from CDFW's WHL and the University of California, is currently working to create a comprehensive genomic database of hundreds of species that range statewide, to help guide conservation and management through an ever-changing environment (Shaffer et al. 2022, Lin et al. 2022, <https://www.ccgproject.org>). For bobcats, the CCGP is conducting a population genomics study aimed at creating a bobcat reference genome assembly, characterizing population genomic structure and patterns of diversity, and simulating population outcomes for different management strategies. The bobcat reference genome was completed in 2022 (Lin et al. 2022). As of 2026, 151 whole genomes are being analyzed. Preliminary data suggests there is moderate genetic diversity (average 1.65 heterozygotes per 1000 base pairs compared to 1 heterozygote per 1000 base pairs in humans) among bobcats statewide. Individuals from locations farther apart (Figure 2) showed greater genetic differences, consistent with the null expectation of isolation by distance which has been documented in other findings (Smith et al. 2020), and no strong barriers for dispersal (Lin, Capel, Curti, Hallas et al. in prep).

However, there may be inbreeding among some individuals in urban landscapes, which was also found in a study using microsatellite markers (Serieys et al. 2015). The results of this population genomics survey of bobcats in California will serve as a baseline against which researchers can evaluate potential changes in genomic diversity over time and resource managers can define genomically-informed management units across the bobcats' range in California.

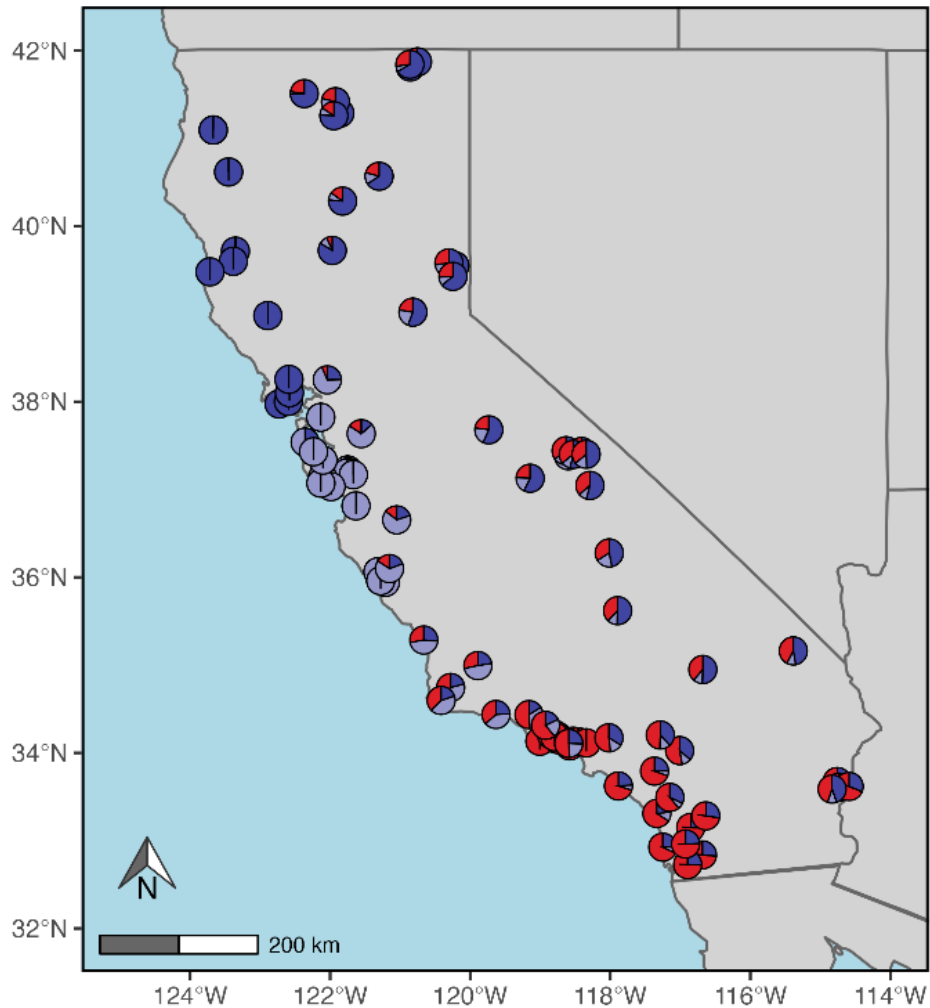


Figure 2: Map of bobcat individual ancestries based on California Conservation Genomics Project unpublished data (Lin, Capel, Curti, Hallas et al. in prep). Each circle represents a bobcat individual, with colored wedges (blue, red, and light blue) showing the proportion of three ancestral populations inferred using ADMIXTURE (Alexander et al. 2009). Nearby individuals tend to share similar ancestry, while those farther apart are more different.

3.2 Population Abundance and Densities

California's first statewide bobcat population estimate of approximately 61,000 individuals was made in 1977, based on trapper catch rates and density estimates for the major habitats in California (Gould 1978). In 1981, an updated estimate of 74,700 pre-breeding adult individuals was produced based on three studies conducted between 1976 and 1980 in four areas of California with variable bobcat harvest (see Section 4.1 for further details). Finally, as a contribution to an estimate of U.S. bobcat populations that was drafted in 2009, CDFW estimated California's bobcat population to be stable with 69,429 - 72,735 individuals (Roberts and Crimmins 2010).

Developing abundance (the total number of bobcats in an area) and population density estimates (the number of bobcats per unit area, often reported as number/100 km²) for bobcats can be difficult (Ruell et al. 2009, Riley et al. 2010, Jacques et al. 2019, Schmidt et al. 2023). Early techniques for estimating density lacked measures of accuracy and precision, and were difficult to interpret, leading to inconsistency and uncertainty (Royle and Young 2008, Jacques et al. 2019). Climate, habitat availability, prey, anthropogenic barriers (Schmidt 2023), and different management strategies also play a role in influencing population dynamics and makes it hard to compare abundance, or density estimates from one area to another. These factors, and the wide range of habitats and conditions occupied by bobcats, may contribute to the wide range of estimated bobcat densities from different studies, not only across the United States (Table 2) but also from different parts of California (Table 3).

Table 2: Bobcat density estimates from across the United States based on various data types and analysis methodologies.

Source (State)	Type of Data	Bobcat Density (per 100 km ²)
Mayer et al. 2022 (RI)	camera surveys	2-14
Stricker et al. 2012 (MI)	genetic data from hair	3
Knick 1990 (ID)	telemetry data	1-9
Wassmer et al. 1988 (FL)	telemetry data	14-42
Lewis et al. 2015 (CO)	telemetry data	15-24
Heilbrun 2006 (TX)	camera surveys	48
Lombardi et al. 2017 (TX)	camera surveys	61
Roberts 2007 (SC)	telemetry data	84
Young et al. 2019 (TX)	camera surveys	100

838

Table 3: Bobcat density estimates from studies in California.

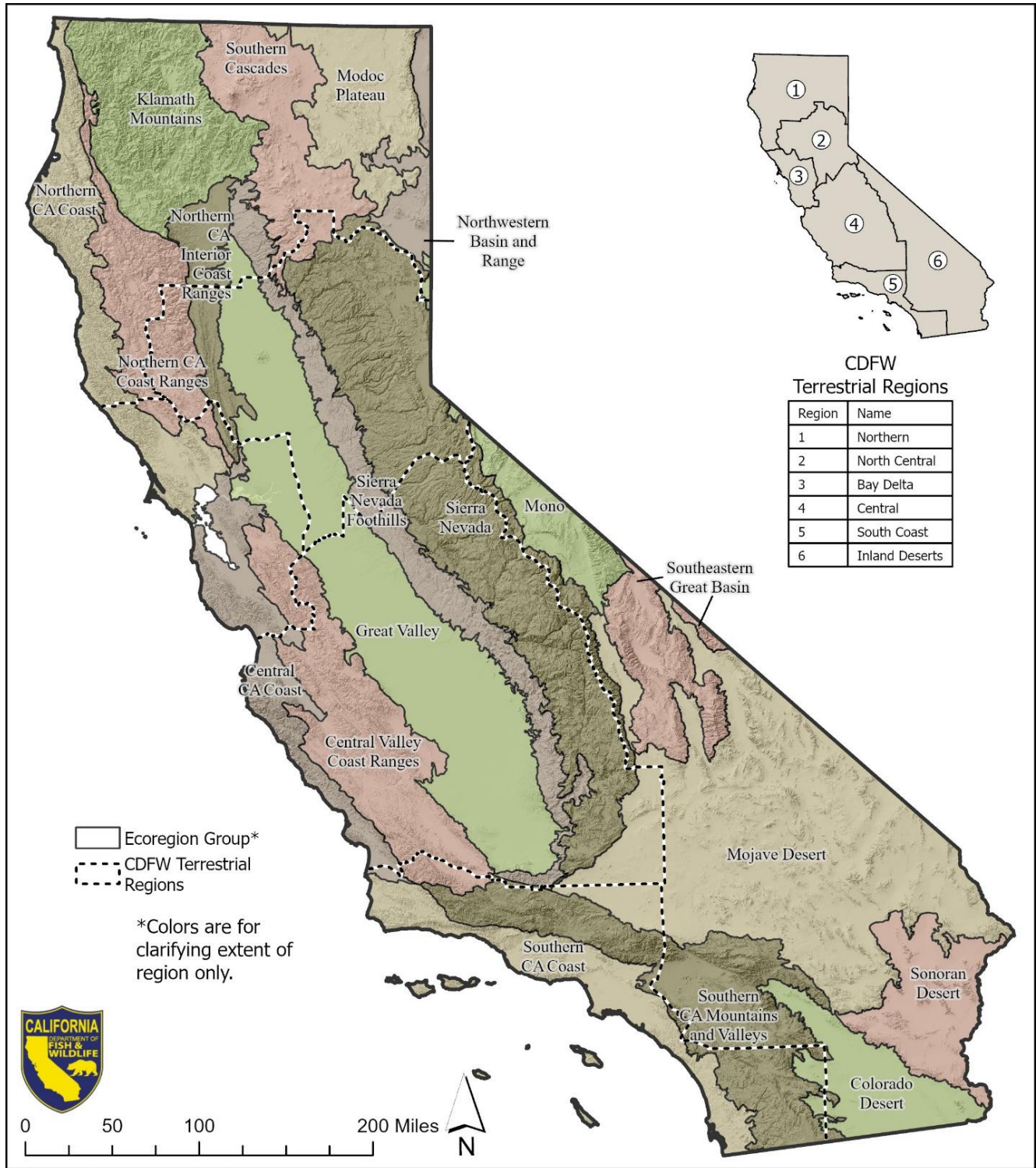
Source	California Counties	Bobcat Density (per 100 km ²)
Zezulak 1980	Siskiyou, Lassen, and Shasta	5
Schmidt et al. 2023	San Diego	11-40
Riley et al. 2010	Ventura	21
Ruell et al. 2009	Los Angeles and Ventura	25-42
Alonso et al. 2015	Orange	30-62
Lembeck and Gould 1979	San Diego	115-153

839

840 Spatial capture-recapture (SCR) models address the limitations of earlier
 841 approaches by considering the spatial distribution of individuals and the spatial
 842 arrangement of sampling. Each individual is assigned a unique ID when it is first
 843 detected (e.g., at a camera location or via fecal DNA) in the study area, and
 844 then a detection history is built of all locations and days at which that individual
 845 was detected (Royle and Young 2008, Jacques et al. 2019). In recent years, SCR
 846 models have been widely used to estimate the absolute density that accounts
 847 for imperfect sampling and detection issues of individuals in a study area (Royle
 848 and Young 2008) and make it feasible to compare estimates across different
 849 studies.

850 The California Bobcat Project developed ecoregional bobcat density (Table 4,
 851 Figures 3 and 4) and abundance estimates based on fecal DNA analysis using
 852 SCR models. We estimated a statewide population of 62,292 (95% CI: 49,672 –
 853 78,454) bobcats (see [BPM report](#) Sections 3.4, 4.3, & 5.3.).

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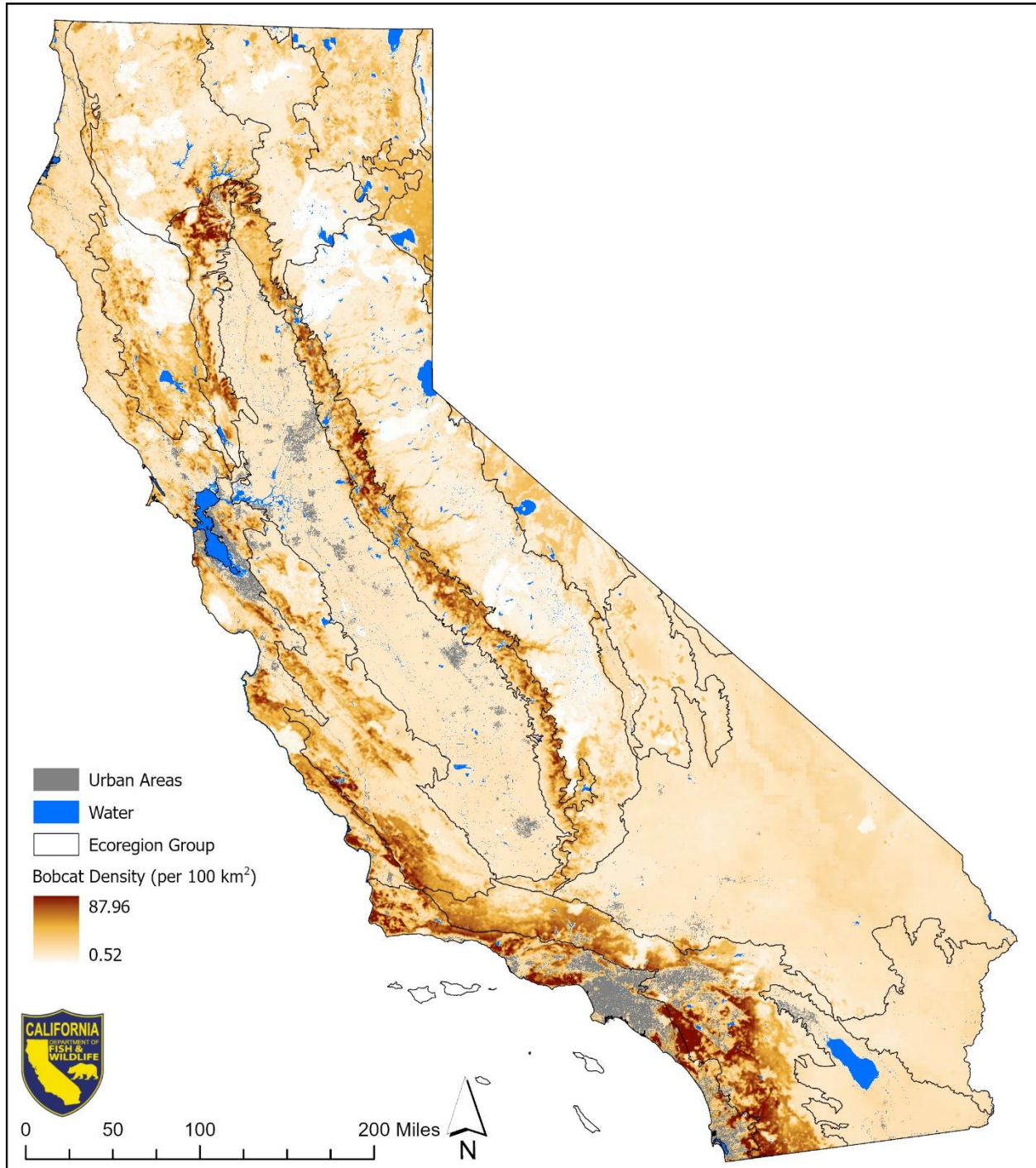


California Department of Fish and Wildlife, Wildlife Branch, D.Mastalir, 20250403

854 Figure 3: Map of California showing 19 ecoregions and 6 CDFW Terrestrial Regions.

Statewide Bobcat Density Based on Fecal DNA

Total Population = 62,292 (95% CI: 49,672 - 78,454)



California Department of Fish and Wildlife, Wildlife Branch, D.Mastalir, 20250411

Figure 4: California statewide bobcat density estimate, with ecoregions outlined and urban areas and water bodies mapped out. Results are based on the California Statewide Bobcat Population Monitoring Project's fecal DNA results.

859

Table 4: Estimated bobcat density (bobcats/100 km²) and abundance by ecoregion mapped out in Figure 3 (based on fecal DNA), from the results of the California Bobcat Project.

Ecoregion	Area (km ²)	Density (SE)	Estimated Abundance (95% CI)
Southern CA Coast	13,557	29.4 (3.3)	3,991 (2,999, 5,361)
Sierra Nevada Foothills	17,921	27.6 (2.6)	4,940 (3,918, 6,263)
Southern CA Mountains and Valleys	27,461	27 (3.3)	7,416 (5,720, 9,731)
Northern CA Interior Coast Ranges	7,397	25 (3.4)	1,847 (1,403, 2,518)
Northwestern Basin and Range	4,684	21.7 (2)	1,015 (805, 1,288)
Central CA Coast	13,697	21 (2.8)	2,878 (2,273, 3,741)
Central CA Coast Ranges	24,766	19.9 (2.6)	4,919 (3,898, 6,376)
Northern CA Coast Ranges	15,344	16.8 (2.5)	2,582 (1,996, 3,568)
Modoc Plateau	13,781	16.3 (1.4)	2,252 (1,823, 2,793)
Northern CA Coast	17,110	16 (1.5)	2,733 (2,161, 3,500)
Mono	7,784	15 (1.5)	1,167 (887, 1,549)
Klamath Mountains	22,371	12.5 (1.7)	2,795 (2,181, 3,745)
Sonoran Desert	12,887	12.4 (0.3)	1,592 (1,091, 2,329)
Colorado Desert	10,908	12.4 (0.4)	1,349 (972, 1,883)
Mojave Desert	66,766	11.9 (0.6)	7,971 (5,420, 11,777)
Southeastern Great Basin	11,044	11.7 (0.9)	1,289 (899, 1,868)
Great Valley	48,890	11.1 (0.5)	5,420 (4,152, 7,080)
Sierra Nevada Mountains	51,064	10.2 (1.7)	5,194 (3,916, 7,210)
Southern Cascades	16,903	10 (1.4)	1,690 (1,323, 2,241)

860

861 3.3 Survival

862 Annual survival rates for bobcats vary across geographic ranges, age classes,
 863 and hunting status (Anderson and Lovallo 2003). Survival rates are often estimated
 864 for different age classes given bobcats face different challenges at each life
 865 stage. Three age classes are typically defined for bobcats: kittens are < 1 year
 866 old, yearlings are 1-2 years old, and adults are > 2 years old (Anderson and Lovallo
 867 2003). Table 5 summarizes annual survival estimates from 20 studies in the United
 868 States and Canada.

869 Kitten survival is difficult to assess and is poorly understood (Moriarty and Riley
 870 2011) because bobcat kittens are too small to monitor with the typical tracking
 871 equipment used for larger cats (Anderson and Lovallo 2003). Annual kitten survival

rates are lower than those of adults and are highly variable (Lovallo 2000). Kitten survival depends heavily on prey availability and the health of the mother, and kittens that become orphaned before they are independent (8-10 months old) from their mother have a higher mortality rate (Knick 1990, Anderson and Lovallo 2003, Hansen 2007). Several studies have estimated kitten survival (the first 90 days of life) ranging from 18-87% (Crowe 1975, Blankenship and Swank 1979, Anderson and Lovallo 2003, Lovallo 2007, Moriarty 2007, Lehman et al. 2024). Bobcats that have kittens closer to the urban environment may face more difficulties, such as human-wildlife conflicts and conflicts with urban specializing competitor species such as coyotes, than they might otherwise. One study found a low survival rate in such areas (16.7%) for a subset of kittens younger than 3 months old, reportedly due to coyote predation; however, that survival rate was higher (66.7%) for kittens 3-6 months old (Moriarty and Riley 2011).

Yearling bobcats may be easier to track than kittens, but their survival rates are also not well documented. Yearlings are typically transient while searching for their own home range, which exposes them to a variety of risks (Anderson and Lovallo 2003, Hansen 2007). Yearling survival highly depends on prey availability, as yearlings can no longer rely on their mother for food (Bailey 1974). High prey availability allows the yearling to practice hunting, have a better and more frequent chance at catching meals, and improve its chance of survival (Crowe 1975).

Bobcat populations that are not hunted or trapped tend to have higher survival rates (Bailey 1974, Crowe 1975, Knick 1990, Chamberlain et al. 1999, Nielson and Woolf 2002), because harvest potentially causes 14 – 82% of bobcat mortalities in areas where bobcat harvest is allowed (Riley et al. 2010, Anderson and Lovallo 2003). One study of a heavily hunted population had a survival rate as low as 49% (Knick 1990). An extremely low survival rate was documented (19%) in a Minnesota population that was subject to illegal poaching in the early 1980s when pelt prices were high (Fuller et al. 1985). Males in harvested bobcat populations tend to have lower survival rates than females, particularly during the first several years of adulthood (McCord and Cardoza 1982, Parker et al. 1983, Lovallo 2001, Anderson and Lovallo 2003). Harvest of reproducing or lactating females can result in kitten mortality and potential mortality of juveniles that are still learning to hunt (Lovallo 2001).

Annual adult survival rates range from 56 – 67% for populations that are harvested, and 78 – 97% for unharvested populations (Rolley 1985, Knick 1990, Chamberlain et al. 1999, Anderson and Lovallo 2003, Hansen 2007, Lehman et al. 2024). In southern California, Riley et al. (2003, 2010) found high survival rates and found that the percentage of development in the home range did not have a significant effect (94.3% survival in areas of low development vs. 82.5% in areas of high development). In the same area of California, Moriarty (2007) found annual survival rates of females to be 69.7% and males 69.4% after a major outbreak of

notoedric mange. A study by CDFW on the eastern slope of the Sierra Nevada found an annual survival rate of 85% with most mortalities resulting from vehicle strikes (Ellsworth et al. 2016; CDFW unpublished data).

The estimated annual adult survival rate of bobcats that were GPS-collared as part of the California Bobcat Project was 77%, with no significant difference between males and females. These results may not be fully representative of bobcat populations in California however, since all collared bobcats from our study were estimated to be adults greater than two years old, and the majority were male and in Northern California ([BPM Report](#), Section 3.9, 4.8, and 5.8).

Fourteen radio-collared bobcats died during the California Bobcat Project (See [BPM Report](#), Table 19). The carcasses of ten of those individuals were recovered from the field and necropsied by the CDFW WHL to ascertain cause of death. The primary diagnoses for causes of death for necropsied collared bobcats included: one from illegal gunshot trauma, four from disease (one attributed to Highly Pathogenic Avian Influenza H5N1), two from emaciation, two from trauma or injury associated with predation, and one from suspected traumatic injuries from a large wild turkey that had been found dead next to the bobcat's body (see [BPM Report](#), Section 4.8).

Table 5: Annual bobcat survival estimates from studies throughout the United States and Canada.

Source	Location & Study Period	Harvest	Sample Size and Type	Estimated Annual Survival Probability
Blankenship et al. 2006	TX (1993-2004)	No	53 collared	adult = 0.85 subadult = 0.68
CDFW unpublished data	CA (2015-2019)	Yes	38 collared	0.85
Chamberlain et al. 1999	MS (1989-1997)	Yes	68 collared	male=0.75 female=0.84
Crowe 1975b	WY (1970-1973)	Yes	161 carcasses	0.67
Fuller et al. 1995	MA (1982-1985)	Yes	15 collared	0.62
Fuller et al. 1985	MN (1971-1981)	Yes	31 collared	0.19-0.61
Jones et al. 2020	IN (1998- 2006)	No	38 collared	0.80
Kamler and Gipson 2004	KS (1995-2000)	Yes	13 collared	0.77
Knick 1990	ID (1982-1985)	Yes/No	11 collared (harvested) 29 collared (unharvested)	Harvested = 0.49 unharvested = 0.67
Koehler 2006	IA (2003-2005)	No	44 collared	0.82

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Landry 2017	WV (2014-2016)	Yes	524 carcasses	Juvenile = 0.82 yearling = 0.77 adult = 0.61
Lehman et al. 2024	SD (2016-2022)	Yes	66 collared adult females 40 collared kittens	yearling = 0.77 kitten (first 90 days) = 0.77 juvenile (91 days-1 year) = 0.23 overall kitten = 0.17
Moriarty 2007	CA (2004-2005)	No	14 marked kittens	0-3 months = 0.25 3-6 months = 0.67 6+ months = 1.00
Morrison 2022	SD (2020-2021)	Yes	35 collared adult females 40 collared kittens	Kitten = 0.17
Nielson and Woolf 2002	IL (1995-2000)	No	75 collared	0.84
Parker and Smith 1983	Nova Scotia (1977-1980)	Yes	605 carcasses	Males = 0.58 females = 0.63
Riley et al. 2003	CA (1996-2000)	No	50 collared	0.76
Roberts 2007	SC (2004-2005)	No	16 collared	0.88
Rolley 1985	OK (1979-1982)	Yes	11 collared 553 carcasses	Adult = 0.53-0.66 juvenile = 0.3
Tycz 2016	SD (2012-2015)	Yes	51 collared 425 female carcasses	0.74

933

934 3.4 Bobcat Interactions with Other Wildlife

935 Understanding the dynamics between bobcats, their competitors, and their prey
 936 is important to bobcat management in California. Each of these groups plays a
 937 crucial role in the food chain of a healthy ecosystem and influences each other's
 938 populations. Bobcats and their competitors and prey may change their local
 939 habitat use or daily activity patterns depending on their selection or avoidance
 940 of one another. By studying occupancy rates of different habitats and temporal
 941 activity patterns of these species individually and collectively, we can begin to
 942 understand the relationships that drive bobcat activity patterns. However,
 943 occupancy does not show the direction of species interactions (e.g., whether
 944 bobcats are attracted to mountain lions, mountain lions are attracted to bobcats,
 945 or both are attracted to some third thing), but simply that two species are more
 946 or less likely to co-occur than expected (e.g., bobcats and mountain lions are
 947 more likely to occupy areas also occupied by the other species). This section
 948 summarizes a multi-species occupancy analysis conducted as part of the
 949 California Bobcat Project and summarizes interactions between bobcats and
 950 other wildlife based on daily activity patterns. Interactions with special-status
 951 species such as fishers (*Pekania pennanti*), Pacific martens (*Martes caurina*), and

California condors (*Gymnogyps californianus*) are emphasized. Bobcat predation of domestic animals is addressed in Chapter 5.

3.4.1 Bobcats Interactions with Competitor Species

Research from the California Bobcat Project on the interactions between bobcats and their competitors (mountain lion, black bear (*Ursus americanus*), coyote (*Canis latrans*), and gray fox (*Urocyon cinereoargenteus*; Sections 4.4 and 5.4 of the [BPM report](#)) found that bobcats did not avoid other carnivores, even though some of those species are known to kill bobcats (Koehler & Hornocker, 1991, Cashman, Pierce & Krausman, 1992, Fedriani et al. 2000, Harveson et al., 2000, Hansen, 2007, Hass 2009). During the project, we found evidence of three bobcats potentially being killed by mountain lions, including one instance in which a GPS collared bobcat and collared mountain lion were at the same location at the time of the bobcat's mortality ([BPM report](#), Section 4.8). Yet our analysis found that of those competitor carnivores, the presence of all but black bears increased the occupancy of bobcats to varying degrees ([BPM report](#), Sections 4.4 and 5.4). Other studies have also found that bobcats do not spatially avoid larger carnivores (Fedriani et al. 2000, Santos et al. 2019, Dyck et al. 2021, Avrin et al. 2023) despite the potential threat they pose. As obligate carnivores, the need to access prey may outweigh the risk of intraguild predation (Fedriani et al. 2000; Hass 2009). Similarly, an overlap in diet between bobcats and other carnivores may show a shared preference for certain habitats (Dyck et al. 2022). Given this, bobcats may rely on temporal partitioning to avoid conflict with larger competitor species, as discussed below.

Across all habitats, bobcats were primarily nocturnal or crepuscular with 36% of bobcat activity occurring between the hours of 05:00 and 17:00 (daytime). [We considered those hours as "daytime" because most of trail cameras areas used for this analysis (43%) were running through the spring season when daylight hours are shorter]. Overall, bobcat temporal activity patterns were similar to the patterns of all competitor species except black bears. Coyotes and bobcats sometimes have dietary overlaps, and their temporal activity can be influenced by when their prey is active as (Neale and Sacks 2001, Thornton et al. 2004). To avoid conflict, bobcats may shift their activity to night in areas with higher diurnal coyote activity (Sergeyev et al. 2023). However, analysis from the California Bobcat Project found higher temporal overlap between bobcats and coyotes than with any other species.

The presence of species that cause disturbance to the area or to the ground, such as cattle, wild boar (*Sus scrofa*), and humans, were associated with a higher likelihood of a bobcat being present, but by a smaller amount than the species outlined above ([BPM report](#), Section 4.4 and 5.4). Cattle are often in open pastures where many bobcat prey species such as ground squirrels, voles, and rabbits are found; and pastures can have long stretches of edge habitat that have cover where bobcats hunt. Although the presence of bobcats and cattle

were positively associated, they had little temporal overlap, meaning that bobcats came to the pastures when the cattle were elsewhere. Similarly, wild boar occupies many of the same vegetation types as bobcats and can prey on the same small mammals, potentially influencing the positive effect wild boar presence on bobcat presence. Bobcats may also be present with wild boar to prey upon piglets (Tewes et al. 1998). When it comes to humans, we found a positive association between human and bobcat use of hiking trails and rural and forest roads. However, bobcats have little temporal overlap with humans as most human recreation happens during the day and carnivores, including bobcats, shift to nighttime activity in areas of high human densities (Wang et al. 2015).

3.4.2 Bobcat Interactions with Prey Species

The occupancy analysis conducted as part of the California Bobcat Project assessed bobcat interactions with several groupings of potential prey species based on approximately 1.7 million wildlife photos taken from study areas across the state ([BPM report](#), Sections 4.2, 4.4, and 5.4). Our cameras were set up to detect bobcats and not specifically to detect smaller prey species, which did not allow us to fully detect many small animals or directly measure prey availability and abundance. However, we were able to summarize prey species detections and model their occupancy. Increased use of an area by prey species and thus higher occupancy suggests greater availability or abundance of that prey.

Potential prey species we detected within the study areas and categorized included wild turkey, quail/pheasant (*Galliformes* species except turkey), small rodents (*Rodentia* and *Soricidae* species, except *Sciuridae* species), squirrel (*Sciuridae* species), rabbit (*Lagomorpha* species), small bird (*Passeriformes*, *Columbiformes*, and *Piciformes* species), skunk (*Mephitidae* species), and small mustelid (*Mustelidae* species except American badger (*Taxidea taxus*) and river otter (*Lontra canadensis*); [BPM report](#), Table 9). The spatial distribution of many carnivores and particularly felids are highly dependent on prey availability (Sanos et al. 2019; Khosravi et al. 2021), and our findings are consistent with this. Bobcat occupancy increased with the presence of all prey species except small mustelids, although some had a stronger influence than others. The presence of wild turkeys had the strongest positive association with bobcat occupancy, while squirrels had the weakest. Our results suggest the relative importance of different prey species on a statewide scale, but local prey diversity and abundance likely play an important role on smaller scale bobcat preferences. For example, in a study near San Diego, California, rodents made up most of bobcat diets (Larson et al. 2015), while studies in the northern United States found rabbits to be the most consumed prey (Nussbaum and Maser 1975, Newbury and Hodges 2018). The presence of prey species had a stronger influence on bobcat occupancy than the habitat variables analyzed by the California Bobcat Project.

Bobcat daytime activity was greater in areas where squirrels, typically diurnal, were abundant and less in areas where rabbits, typically nocturnal, were

abundant. This suggests a level of behavioral plasticity among bobcats, where they shift their activity times based on the available prey. Further, bobcat daytime activity was significantly higher in evergreen forests, where we detected more squirrel activity than in herbaceous and shrub or scrub habitats, where we detected more rabbits and rodent species. Non-squirrel rodents were abundant in all habitats and as a result, their relative abundance may not be as influential as those of the more spatially variable squirrel and rabbit populations.

3.4.3 Bobcat Impacts on Prey Populations

Discerning the impacts of a particular predator on a particular prey species is challenging. Relationships among species are complex, with individual species often competing with, preying upon, and being preyed upon by multiple other species (Anderson and Lovallo 2003). Bobcats are opportunistic predators that regularly kill and consume many different animals, but food habit studies from California show that rodents and rabbits are their primary prey (McLean 1934, Grinnell et al. 1937, Leach and Frazier 1953, Zezulak and Schwab 1980, Fedriani et al. 2000, Riley et al. 2010, Larson et al. 2015, CDFW unpublished data 2024, Roberts 2023). While CDFW received public input during project scoping regarding the potential for bobcats to adversely impact the populations of certain prey (e.g., wild turkey, quail, sage-grouse (*Centrocercus urophasianus*), deer)), we are not aware of studies documenting such impacts. As generalists, bobcats typically hunt a wide variety of prey and are unlikely to specialize in any one species in an area or be the only predator of that species (Hansen 2007, Hass 2009, Newbury and Hodges 2018). In addition to predation, prey populations are typically influenced by many factors including disease, habitat loss or change, overpopulation, migration, and genetic factors. As bobcats typically rely on many species, they are not likely to have a major impact on the populations of any particular species (Hansen 2007).

Bobcats have long been thought to prey on sage-grouse chicks and adults, which is currently a candidate for listing as threatened or endangered under the California Endangers Species Act (Nelson 1955, Hartzler 1974, Holloran et al. 2005). However, the first confirmed case of sage-grouse nest predation was not recorded until 2013 when a bobcat was filmed flushing an incubating bird from its nest and then eating the contents of the eggs (Lockyer et al. 2013). In Wyoming, bobcat DNA was detected at only one of 30 sage-grouse nests from which hair samples were successfully analyzed, whereas coyote DNA was detected at 53% of nests and badger DNA was detected at 23% of nests (Kirol et al. 2018). In a review of the literature regarding predators of sage-grouse, Conover and Roberts (2017) found that adult sage-grouse were most often taken by raptors (golden eagles [*Aquila chrysaetos*], bald eagles [*Haliaeetus leucocephalus*], great horn owls [*Bubo virginianus*], snowy owls [*Bubo scandiacus*]) and coyotes; juveniles were most often taken by coyote and eagles; and nests were most often

predated by ravens, badgers and coyotes. Bobcats thus do not seem to be a significant predator of sage-grouse.

While bobcats are known to kill deer fawns in some areas (Vreeland et al. 2004; Kautz et al. 2022), most studies have found deer do not make up a substantial portion of bobcat diet (Hamilton and Hunter 1939; McLean et al. 2005; Brockmeyer and Clark 2007). Bobcats consume more deer in the northeast compared to other parts of the United States, but rabbits and rodents still make up most of their diet across their entire range (Hamilton and Hunter 1939; Beasom and Moore 1977; McLean et al. 2005; Hansen 2007). In areas where bobcats prey on deer, they do so more commonly in the fall and winter when deer often die from the harsh weather, starvation, and hunting (Fitts and Sealander 1978; Anderson and Lovallo 2003; McLean et al. 2005; Hansen 2007), suggesting some deer are scavenged. Where bobcats have been documented killing deer fawns, coyotes and black bears are the most common predators of deer fawns (Vreeland et al. 2004; Kautz et al. 2019; Edge et al. 2023). We were unable to find published literature documenting bobcats killing or consuming deer in California.

3.4.4 Bobcat Interactions with Special-Status Species

Bobcats are opportunistic hunters that may kill and eat anything that they can catch, as discussed in Chapter 2.5. California has numerous [special-status animals](#) that bobcats could potentially encounter, interact with, hunt, and consume. In this section we focus on several such species which bobcats are known to prey upon and could potentially affect their populations.

Fisher

The fisher is a medium-sized North American carnivore that is an obligate forest dweller due to its use of tree and snag cavities and platforms for dens and rest sites (U.S. Fish and Wildlife Service 2020). Historically, fishers in California inhabited most of the Sierra Nevada Mountain range, but over the last century their distribution has dwindled, resulting in two spatially isolated populations (Zielinski et al. 2005). One population occurs in northern California (and extends into southern Oregon), and the other occurs in the southern Sierra Nevada (SSN) (Zielinski et al. 2005, Wengert et al. 2014, U.S. Fish and Wildlife Service 2020). The southern Sierra Nevada population is listed as endangered pursuant to the state and federal endangered species acts.

Bobcats are the primary predator of fisher in California, although mountain lions and coyotes also kill fishers (Wengert 2013, Wengert et al. 2014, Gabriel 2015, U.S. Fish and Wildlife Service 2020). Bobcats are found within most of the fisher's range in California. Some forest management practices and natural events create forest openings, which may attract bobcats and increase their likelihood of co-occurrence with fishers (Wengert et al. 2013). Predation, by carnivores such as mountain lions and bobcats, has been identified as the most important cause of mortality rate (19.5%) for some fisher populations (Sweitzer et al. 2016), and along

with poisoning from anticoagulant rodenticides could potentially limit the ability of fisher populations to expand (Gabriel et al. 2015, Sweitzer et al. 2016).

The survival rate of adult female fishers heavily influences overall population stability and size (Spencer et al. 2011, Gabriel et al. 2015). A study of three major fisher populations in California attributed 61% of all fisher deaths to predation, and bobcats were identified as the most common predators (Wengert et al. 2014). Bobcats only preyed on females, likely because they are significantly smaller than males, while male fishers were primarily killed by mountain lions (Wengert et al. 2014). Additionally, bobcats were more likely to prey on female fishers in the spring (Wengert 2014) when they were potentially caring for dependent kits (Powell 1993). Although bobcats are a common predator of fishers, more research into the dynamics between these two species is needed (Wengert et al. 2014).

Pacific Marten

The Pacific marten is a small-bodied carnivore whose range in California (Delheimer et al. 2021) overlaps with that of the bobcat. Like the fisher, it primarily inhabits forested habitats. Two subspecies occur in California, the Sierra marten (*M. c. sierrae*), which occurs in the higher elevation forests of the Sierra Nevada, southern Cascades, and Klamath Mountains (Slauson et al. 2019), and the Humboldt marten (*M. c. humboldtensis*), which occurs in low elevation coastal areas of northern California and Oregon (Moriarty et al. 2019, Slauson et al. 2019, Delheimer et al. 2021, Martin et al. 2022). The Humboldt marten, also known as the coastal marten or the Pacific marten Coastal Distinct Population Segment (DPS), was listed as a threatened species under the Endangered Species Act (ESA) in 2020 (U.S. Fish and Wildlife 2020). The Sierra marten is not listed (Delheimer et al. 2021).

Predation is reported as a substantial source of mortality (44%) for marten populations and bobcats are widely cited as the main cause of this predation (Bull and Heater 2001, Wilk and Raphael 2018, Slauson et al. 2019, Martin et al. 2022, Anderson 2023). Interspecies competition with other forest carnivores such as fishers (Pauli et al. 2022) and predation by bobcats may have negative effects on marten distributions and may influence their overall survival and population growth (Slauson et al. 2019, Martin et al. 2022, Anderson 2023). Martens (excepting the Humboldt marten) are well-adapted to snowy environments (Krohn et al. 1997), and those areas may facilitate less competition with fishers (Krohn et al. 1997, Pauli et al. 2022) and less potential predation by bobcats, which are not as adapted to such habitats (Anderson 2023). These findings, along with the apparent negative correlation between marten and bobcat occupancy found during the California Bobcat Project, are consistent with some spatial partitioning between these species (Slauson et al. 2019, Anderson 2023). The California Bobcat Project found the likelihood of small mustelid (a group that included martens) occupancy doubled when bobcats were not present compared to

when they were, but these findings could be due to a difference in habitat preference between the species ([BPM report](#), Section 4.4). Such spatial partitioning is not known or expected in low elevation habitats occupied by Humboldt martens.

California Condor

The California condor has been protected as an endangered species by federal law since 1967 and by California state law since 1971. While condor populations have increased, the species is still dependent on the release of captive-bred juveniles to grow the population. Condors reach adulthood at 5 years of age and can live for over 60 years, much longer than most other birds (Koford 1953, Wilbur 1978). Unfortunately, due to high mortality from lead toxicosis, the true lifespan of wild condors is not yet known. Condors specialize on carrion and search for food from the air (Koford 1953, Wilbur 1978). Though the take of wildlife with lead ammunition is illegal in California, condors are still being exposed to lead by feeding on carrion with lead fragments (Bakker et al., 2017, 2024, 2025, 2026). Nesting condors raise only one chick at a time and it takes more than a year for a young bird to be able to live on its own (Koford 1953, Wilbur 1978). Due to these slow life history traits, mortalities, including predation, can represent a serious setback to the species' recovery.

Bobcats have been documented predating California condors. There are over 10 condor deaths determined or suspected to have been caused by bobcats (USFWS 2026 unpublished data). Bobcats have killed condors by entering flight pens as well as cueing into trees that are regularly used for roosting. Mercado et al. (2006) recorded a bobcat predation event within a condor release program aviary after the bobcat entered through a pile of adjacent boulders. Additionally, Mercado et al. (2006) documented a young, newly released condor that was scavenged by a bobcat, but it was unknown whether the bird had died of other causes. In 2014, a bobcat killed an adult condor in a flight pen at Hopper Mountain National Wildlife Refuge (USFWS 2023). Bobcats have also preyed on condors at roost sites. This is especially problematic when captive-bred juveniles are released into the wild. As naïve individuals with little to no experience in the wild in the presence of predators, newly released captive-bred condors are highly susceptible to predation. In 2014, a single bobcat killed four juveniles and one adult condor at three different roost sites on the Bitter Creek National Wildlife Refuge. A similar event occurred at the end of 2025 to early 2026. Condor managers continue to fortify condor flight pens with predator exclusion fences to minimize the risk of bobcat predation. Managers also work with partners to remove problematic predators that cause mass mortality in short time periods.

San Joaquin kit fox

The federally endangered and state threatened San Joaquin kit fox (*Vulpes macrotis mutica*) was formerly widespread in arid shrubland and grassland habitats across central California (U.S. Fish and Wildlife Service 1998, Cypher et al.

2022). Its current range is significantly reduced due to habitat loss. There are now three core populations and fewer than a dozen smaller sub-populations that depend on the core populations for recruitment and safeguarding against extirpation (Cypher et al. 2022).

Bobcats co-occur with San Joaquin kit foxes and have been documented preying on them. However, the frequency of predation events and the potential for population-level impacts is unknown (Cypher personal comm., 2024). Cypher et al. (2019) found bobcats to be one of the primary predators of kit foxes at their study site, with 6 of 23 kit fox mortalities suspected to be from bobcat predation. Coyotes and golden eagles were also identified as important predators of kit foxes from this study (Cypher et al. 2019). In a study of a different kit fox subspecies in Oregon, Benedict and Forbes (1979) reported 12 kit fox skulls near an active bobcat den. Researchers hypothesize that bobcats and coyotes may act as a limiting factor for the distribution of San Joaquin kit fox populations; however, this conjecture is still theoretical (Cypher et al. 2023, Cypher personal comm., 2024). It is reasonable to conclude that bobcats have the potential to significantly impact kit fox populations under specific ecological conditions, but further research is needed (Cypher personal comm., 2024).

Chapter 4. Factors Affecting Survival

Bobcats die from many causes, including infectious disease, parasites, predation lack of resources that lead to starvation or dehydration, burns from fast moving wildfire, drowning, injuries or infections, electrocution, and human-caused mortality (Young 1958, Knick 1990, Anderson and Lovallo 2003, Hansen 2007). In California, it is currently unlawful to take bobcats through hunting and trapping, but other direct and indirect sources of human-caused mortality include habitat removal and degradation, vehicular strikes, authorized removal by holders of depredation permits, illegal killing, and exposure to toxicants such as anticoagulant rodenticides ([BMP report](#), Sections 4.8 and 4.9). In states where a bobcat harvest occurs, anthropogenic mortality from hunting or trapping is the leading cause of bobcat deaths (Anderson and Lovallo 2003, Hansen 2007).

4.1 Bobcat Health and Disease Monitoring

Wildlife health surveillance systems are designed to detect emerging diseases and toxins, show their absence, and identify their prevalence and distribution in populations of interest (Mariner et al. 2011, Woodford 2009). These systems inform wildlife managers about population-level impacts and provide baseline data for future management needs. Recovery and postmortem examination (i.e., necropsy) of carcasses are a primary source of information about causes of death and disease in free-ranging wildlife. However, carcass submission data may not accurately reflect population mortality patterns due to inherent limitations such as selection bias – i.e., sick or diseased animals may be more or less likely to be found depending on proximity to people, body size, and manner of death (e.g., roadkill versus mortality in remote areas). Additionally, postmortem decomposition can inhibit accurate diagnostics and limit the ability to distinguish primary from incidental causes of mortality. Despite these limitations, carcasses provide valuable insight into mortality-associated diseases, toxins, and other conditions and remain an important component of wildlife health surveillance programs.

From January 2020 through July 2023, CDFW implemented an enhanced bobcat health monitoring project using carcasses to identify trends or emergence of infectious diseases and toxins. One hundred and forty-nine bobcat carcasses, across all sexes and age classes, were submitted and necropsies were performed on 128 ([BPM report](#), Section 4.9). An added 10 bobcats that had been radio-collared for the California Bobcat Project were necropsied and those results are discussed in Section 3.3 above.

As part of its ongoing work to monitor the health status of bobcats in California, the CDFW Wildlife Health Laboratory continually collects data on bobcat health conditions, which may be worsened or caused by anthropogenic activity, including rodenticide exposure and toxicosis, viral diseases, and notoedric mange ([BPM report](#), Sections 4.9 & 5.9).

4.1.1 Trauma and Injury

Bobcats can suffer traumatic injuries from a variety of natural and anthropogenic sources. Vehicular strikes accounted for 32% (n=48) of carcass submissions to CDFW between 2020 and 2023 (Figure 3; also see BMP report Section 4.9). Other traumatic mortalities include trauma due to gunshot wounds from illegal killing (n=4, 3%), interspecies conflicts (n=6, 4%; three cases of conflict with coyotes and one with racoons [according to Wildlife Incident Reports], one from a failed attempt at hunting a turkey, and one stomped on by an alpaca). Additionally, generalized traumatic injuries, such as fractures to various bones of the body, were noted in 19 (13%) submitted carcasses for which the cause of death was otherwise not characterized. Eight carcasses (7%; two adult females and six adult males) submitted to the WHL had been dispatched under depredation permits, all of which were reported to have been killing domestic chickens, ducks, or geese. Two bobcats were dispatched to protect public safety, one of which was infected with rabies virus and is discussed below.

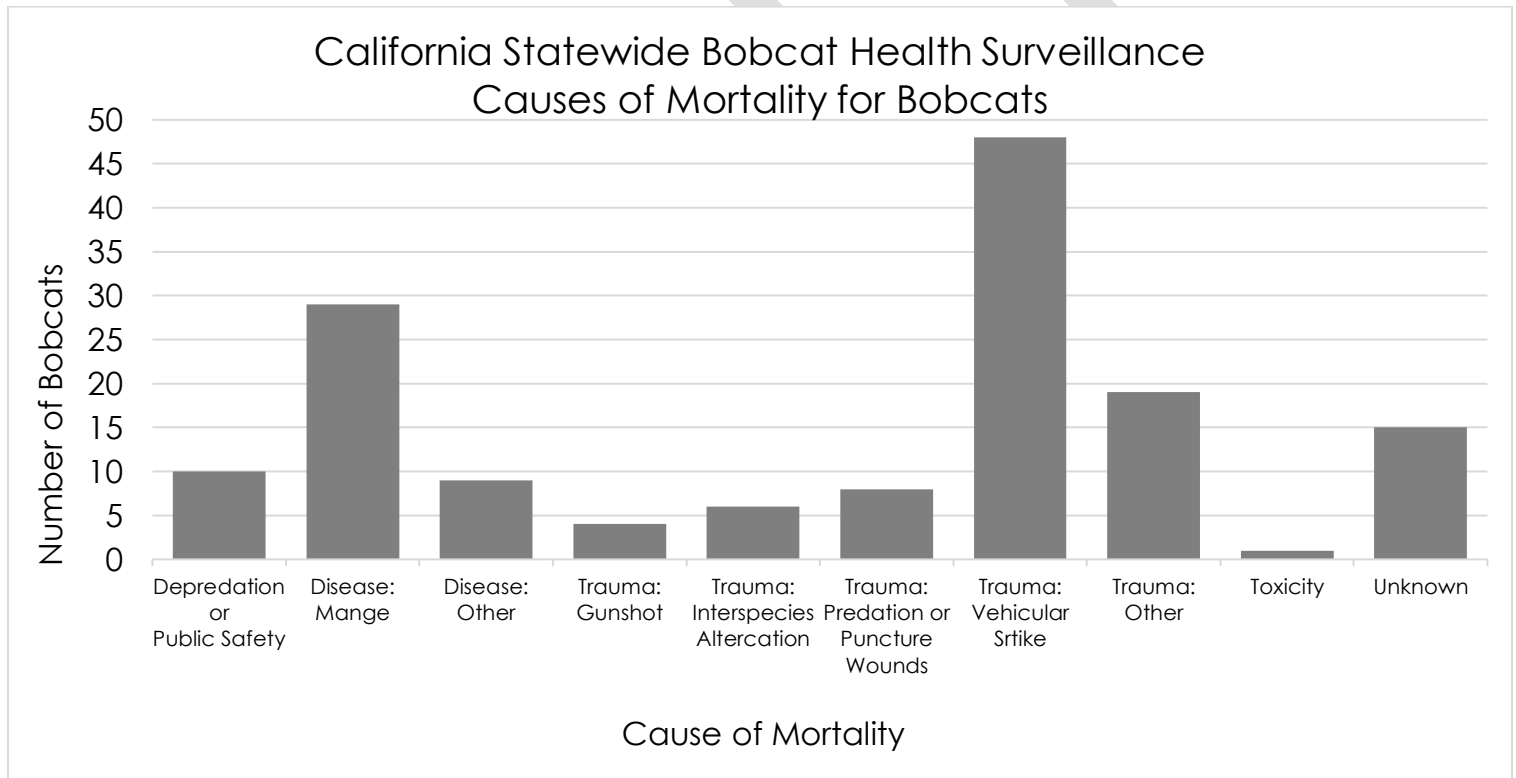


Figure 5: Causes of mortality for opportunistically collected bobcat carcasses based on postmortem examination (n=149) from the statewide bobcat health surveillance study from the California Bobcat Project (BPR section 4.9).

4.1.2 Pathogens and Parasites

Pathogens and parasites can be a direct source of bobcat mortality or can cause morbidity that weakens the animal, thus potentially leading to death from

secondary causes. Bobcats may be exposed to viral, bacterial, or parasitic agents at latrines, marking sites, or den sites; through contact with each other during fighting or mating; or contact with other animals and prey they may encounter (Riley et al. 2004). Although rare, bobcats can transmit zoonotic diseases such as rabies (Emmons et al. 1973), sylvatic plague (Anderson and Lavallo 2003), toxoplasmosis (Bevins et al. 2012), and leptospirosis to humans (Straub et al. 2021).

Although all mammals are considered susceptible to rabies virus infections, skunks, foxes, raccoons, coyotes, and bats represent the most common sylvatic hosts associated with the 10 rabies virus variants in North America (Krebs et al. 2003, Boutelle et al. 2025). In California, strains of rabies virus are adapted to and maintained in striped skunks and several bat species, but in not wild felids such as bobcats. Bobcats, however, can contract rabies and once infected they can transmit the rabies virus to humans and other mammals. This was observed in San Diego County in 1969, where a young boy died from the virus after being bitten multiple times by a rabid bobcat (Emmons et al. 1973, California Department of Public Health 2022). This rabid bobcat was one of 25 bobcats documented with rabies in San Diego County between 1966 and 1969 due to an increase in cases associated with the Mexican dog rabies variant in southern California (California Department of Public Health 2022). A bobcat infected with a bat rabies variant was documented in Trinity County in 2022 and was dispatched for public safety reasons (BMP report, Section 4.9). This was the first rabid bobcat documented in California since 1990 when two cases were identified in Mendocino and Monterey counties.

Other viral diseases reported in bobcats include feline leukemia virus (FeLV), feline immunodeficiency virus (FIV), feline infectious peritonitis (FIP), feline rhinotracheitis, feline herpesvirus (FHV), and feline calicivirus (FCV; McCord and Cardoza 1982, Anderson and Lavallo 2003, Riley et al. 2004). Feline panleukopenia (FPV), also known as feline distemper and feline infectious enteritis, is known to be highly infectious and often fatal for all felines (Povey and Davis 1977) with one case documented in a bobcat during the health study. The FIV and FeLV retroviruses can contribute to immunosuppression in felids, although their prevalence is low in free-ranging wild felids (Petch et al. 2022). While many of these pathogens and their associated diseases are not believed to cause significant population-level morbidity and mortality, pathogens like FeLV are of heightened interest as they can be transmitted from infected domestic cats to wild bobcats and mountain lions. Spillover infections from FeLV have been documented to cause progressive disease in mountain lions (Petch et al. 2022). In the CDFW 2021-2023 health study, only one bobcat from Riverside County and one bobcat from Los Angeles County tested positive for FeLV and FIV respectively ([BPM report](#), Section 4.9). These values are consistent with low prevalences documented in the literature (Petch et al. 2022).

The Eurasian strain of highly pathogenic avian influenza virus (HPAI) H5N1 was first detected in wild birds in California in July 2022 and was reported in 48 counties in California as of April 2023 (CDFW 2025, [California Department of Food and Agriculture](#)). Mammals and birds may be exposed to HPAI and other avian influenza viruses when feeding on infected birds, or less commonly through mammal-to-mammal transmission (Uhart et al. 2024). In December 2022, a bobcat from Butte County that was being tracked by the California Bobcat Project was confirmed to have died from HPAI. Subsequently, ten more mammals tested for the disease in 2022, also were confirmed to have died from HPAI (six mountain lions, two fishers and two raccoons). Other states have also reported HPAI exposure and infection in free-ranging bobcats (Turner et al. 2025). CDFW will continue to conduct surveillance testing for avian influenza.

Sylvatic plague, tularemia, salmonellosis, leptospirosis, brucellosis, tuberculosis, and other bacterial diseases are known to affect bobcats (Anderson and Lovallo 2003, Hansen 2007, Straub et al. 2021, Riley et al. 2004).

Bobcats can be infected with many kinds of internal (endo) and external (ecto) parasites (Hansen 2007) and those found in an individual bobcat are likely to depend on factors like climate, habitat, and prey (Hiestand et al. 2014). Endoparasites reported in bobcats include various nematodes such as roundworms (e.g. *Dirofilaria* spp., *Toxocara cati*, *Toxascaris leonina*), stomach worms (*Physaloptera* spp.), hookworms (e.g., *Ancylostoma caninum*), and lungworms such as *Troglostrongylus* spp. (Reichard et al. 2004) and *Cylicospirura* spp. (Ferguson et al. 2011). Other intestinal parasites include tapeworms (Hamilton and Hunter 1939, Rollings 1945, Bursey and Burt 1970, Mitchell and Beasom 1974, Stone and Pence 1979, Whittle 1979, Anderson and Lovallo 2003, Hiestand et al. 2014), trematodes (e.g., *Alaria* spp., *Paragonimus kellicotti*), and acanthocephala (e.g., *Macracanthorhynchus ingens*; Hiestand et al. 2014). Protozoan endoparasites include *Toxoplasma gondii* (Riemann et al. 1975), *Cytauxzoon felis*, *Sarcocystis* sp., and feline infectious anemia (*hemotropic Mycoplasma* spp.; Anderson and Lovallo 2003). Ectoparasites reported on bobcats include fleas, ticks, lice, fungal pathogens such as ringworm, and pathogenic mites such as *Sarcoptes scabiei* and *Notoedres cati* (Lovallo 2013).

4.1.3 Notoedric Mange

Mange is a highly contagious, progressive skin disease caused by a parasitic mite. In California, wild felids such as bobcats can be infested with the mite *Notoedres cati* (Riley et al. 2007, Serieys et al. 2013), causing notoedric mange. The hallmark of notoedric mange infestation is hair thinning and loss that begins around the head and neck (Penner and Parke 1954) and eventually spreads across the body, causing thickened, leathery, hardened, and extremely itchy skin (Bowman et al. 2008, Serieys et al. 2013, Foley et al. 2016). As the disease progresses, it causes considerable suffering, predisposing the individual to secondary bacterial infections through open wounds, changes in behavior, emaciation, and death

(Maehr et al. 1995, Bornstein et al. 2001, Niedringhaus et al. 2019, Riley et al. 2007, Serieys et al. 2013, Stephenson et al. 2013, Foley et al. 2016). Secondary systemic health problems in mange-infested bobcats include lethargy, not eating and drinking, weight loss and emaciation, difficulty regulating body temperature, elevated white blood cell counts, enlarged lymph nodes, hypoproteinemia (lowered levels of blood proteins), and a variety of metabolic imbalances such as hypoglycemia (low blood sugar levels), hyponatremia (high sodium levels), and hyperchloremia (high chloride levels; Serieys et al. 2013, Foley et al. 2016). Infested bobcats can be treated and recover from the disease; however, treatment administration of wild animals is challenging, and treated bobcats can get reinfected with mange mites after therapeutic effects wane. For advanced mange cases, individuals may need intensive care in a temperature-controlled environment including antibiotics, antifungals, intravenous fluids, and refeeding diets to treat secondary disease and debilitation (Foley et al. 2016, Rowe et al. 2019, Rudd et al. 2020).

Parts of California have been identified as “hot spots” for notoedric mange outbreaks, including Santa Clara County, parts of the central coast including Monterey County, and southern California (especially Los Angeles, Ventura, and Orange counties; Riley et al. 2010, Foley et al. 2016). Mange outbreaks in California can have population-level effects (Riley et al. 2007, Riley et al. 2010, Serieys et al. 2018) on local bobcat populations. Notoedric mange accounted for 19% (n=29) of carcass submissions to the CDFW during the bobcat health study. The carcasses with mange came from the southern two-thirds of the state and Los Angeles County had the highest number of submitted bobcats that died from mange (n=11).

4.1.4 Rodenticide Exposure and Toxicosis

Rodents are often in conflict with humans and managing their populations in both urban and agricultural settings can include the use of rodenticides, which fall into two main categories: anticoagulant rodenticides (ARs) and non-anticoagulant rodenticides. ARs are broken into two sub-categories: first-generation (FGARs) and second-generation (SGARs). FGARs include warfarin, coumatralor, chlorophacinone, and diphacinone. These compounds require multiple feedings for a lethal dose and are metabolized by the body more rapidly than SGARs. The SGARs include brodifacoum, bromadiolone, difenacoum, and difethialone. SGARs are more acutely toxic than FGARs. While SGARs are often lethal after a single feeding, rodents may take several days to perish and may continue to consume more bait during that time.

ARs prevent the body from using vitamin K properly, which prevents blood from clotting. Substantial ingestion results in bleeding and death (Erickson and Urban 2004). AR exposure has been associated with abnormal immune responses similar to those found in response to allergens, infections, and novel pathogens (Serieys et al. 2013, 2015, 2018, Fraser et al. 2018). AR exposure was also associated with

significant differences in gene expression in bobcats, including upregulating genes associated with immune function and the metabolism of foreign substances and downregulating genes associated with immune function and skin integrity (Fraser and Mouton et al. 2018).

SGARs persist in an animal's body tissues for a long time which can increase risks of secondary exposure to non-target wildlife. The harm from ARs to nontarget mammals and birds is well documented (Erickson and Urban 2004, Riley et al. 2007, Serieys et al. 2015, 2018, US EPA 2024) but is likely often undetected and underreported because confirmation of exposure requires testing of liver tissue from collected carcasses (Riley et al. 2007). Nontarget species can be exposed to ARs by either eating poisoned bait (i.e., primary exposure) or by eating poisoned prey (i.e., secondary exposure; Erickson and Urban 2004). As obligate carnivores that often consume rodents, bobcats are exposed secondarily to ARs from eating poisoned or contaminated prey (Riley et al. 2007, Serieys et al. 2015). Bobcats that repeatedly consume poisoned or contaminated prey may suffer chronic exposure from multiple ARs. The impacts of repeated sublethal exposures are unclear but could predispose bobcats to excessive bleeding following an otherwise non-lethal traumatic injury or increased sensitivity to added exposure(s) (Erickson and Urban, 2004). Bobcats can also be exposed to ARs during prenatal development (Serieys et al. 2015, 2018).

In the California Bobcat Project, ARs were detected in 78% (100) of the 129 bobcat carcasses tested, with 83 (64% of these having two or more ARs detected and 60 (47%) having three or more ARs detected (see Section 4.9 of the BPM). One incident of fatal AR exposure was documented in Los Angeles County in January 2022.

In southern California, bobcat susceptibility to severe notoedric mange has been statistically associated with AR exposure (Riley et al. 2007, Serieys et al. 2015, Serieys et al. 2018). However, it is still unknown whether the link between AR exposure and mange infection is coincidental or causal. Bobcats living closer to urban areas have greater and more chronic exposure to ARs (Serieys et al. 2015, Steinberg et al. 2015). Of the 29 bobcats whose death was attributed to notoedric mange in the California Bobcat Project, 28 had been exposed to ARs. The one bobcat that died from mange without having been exposed to ARs was reported to have been a yearling female from Los Angeles County. Consistent with the known distribution of mange, those bobcats that died from mange were primarily from the urban and suburban areas of the Southern Coast, Southern Mountains and Valleys, and Central Coast ecoregions, while AR-exposed bobcats which died from other causes were more broadly dispersed across the state ([BPM report](#), Section 5.9).

Non-anticoagulant rodenticides include bromethalin, strychnine, zinc phosphide, aluminum phosphide, and cholecalciferol. Each of these compounds act in a different way, but all can be lethal after one feeding (Erickson and Urban 2004,

US EPA 2024). The use of non-anticoagulant rodenticides applied for controlling rodents, especially neurotoxic bromethalin, has increased in California, likely because of enacted legislation that restricted the use of ARs. Bromethalin exposure and toxicosis in non-target wildlife is more challenging to detect and diagnose compared to AR exposure and toxicosis. However, bromethalin exposure and toxicosis have been documented in wild mammals (CDFW 2021, 2022a, 2023, 2024b), and raptors (Murray and Cox 2023). The California bobcat study found that 12% of tested bobcats (13 of 106 carcasses, from 31 counties) had been exposed to bromethalin.

4.2 Habitat Connectivity, Movement Ecology and Road Mortality

Conserving wildlife corridors and creating safe road crossings that connect areas of suitable habitat is vital to conserving California's native species and wildlife diversity. Roads are a major source of wildlife mortality and isolation, and California is making strides to protect and improve critical linkages between areas of wildlife habitat. CDFW has identified and prioritized barriers (roads, railways, and canals) to habitat connectivity across California (CDFW 2022b), and Assembly Bill (AB) 2344 (Safe Roads and Wildlife Protection Act; 2022) directed the California Department of Transportation, in consultation with CDFW, to inventory and prioritize wildlife connectivity needs and to plan for improving connectivity. Evidence of this work can be seen in the Wallis Annenberg Liberty Canyon Wildlife Crossing, slated to be completed in 2026, that will cross over the ten-lane US-101 highway in Los Angeles County and reconnect critical areas of open space on either side of the highway. Another example of work and collaboration is the Laurel Curve Wildlife Crossing, an undercrossing of Highway 17 in Santa Cruz County. When it opened in early 2023, the first animal documented using the undercrossing was a bobcat.

Bobcats are sensitive to habitat fragmentation and are less likely to be found in small, isolated patches of habitat. Thus, movement corridors that connect larger patches of habitat are critical to preserving bobcat populations in areas of human development (Crooks 2002). Bobcat dispersal events, home range sizes, and ultimately population genetics and health are all affected when bobcat movements are restricted by human development (Riley et al 2010, Serieys et al. 2015). Fortunately, these effects can be mitigated by maintaining corridors of natural vegetation and road crossings, such as underpasses and drainage culverts that allow bobcats to discreetly travel through areas of human development and across roads (Tigas et al. 2002, Riley et al. 2006, 2010; Serieys et al. 2021, Schmidt et al. 2021). Tigas et al. (2002) found that when corridors were available, bobcats preferred to travel through them as opposed to traveling through developed areas. Because of this, bobcats have been considered indicator species when assessing the functionality of wildlife corridors (Crooks 2002, Kozakiewicz et al. 2019).

As bobcats in California utilize many habitats and move long distances in search of mating opportunities or resources, many bobcats will encounter roads that represent a challenge to movement or a risk to survival at some point in their life. Significant roadways, such as primary roads (highways or freeways), secondary roads (roads that feed into primary roads), and tertiary roads (urban roads that connect secondary roads to neighborhoods, Riley et al. 2014), threaten bobcat survival, and the size and characteristics of bobcat home ranges are influenced by the presence of roads (Tigas et al. 2002, Riley et al. 2003, 2006, 2014, Riley 2006, Poessel et al. 2014). Serieys et al. (2021) found the nature of specific roads influenced bobcat crossing and safety in the San Francisco Bay Area. Bobcats crossed roads more commonly in locations with high vegetative cover next to the roadway. The authors also found bobcats were able to safely cross Highway 101 where riparian areas crossed under significant overpasses. In contrast, a much-less traveled arterial road was more dangerous due to a prominent concrete and mesh median divider and lack of safe crossing points. Although road mortality is a threat to urban bobcats, it has been suggested that animals in urban areas may also gain familiarity with roads and develop the ability to safely navigate them (Riley et al. 2006).

In the California Bobcat Project, six GPS-collared bobcats crossed over or under major primary and secondary roadways. Three bobcats crossed primary roads and then returned: two crossed US route 395 in separate locations (Mono and Inyo Counties), and one crossed under Interstate 80 (I-80; Nevada County). The two bobcats that crossed US 395 crossed over the roadway in numerous locations, and the highway bisected the core use areas of their home ranges. Another collared bobcat traveling near I-80 (Sierra County) moved close to the roadway multiple times but did not cross. Three other bobcats crossed over or under secondary roads including State Route (SR) 1 (Mendocino County), SR 89 (Siskiyou/Shasta Counties), and SR 152 (Santa Clara/San Benito Counties). In one of those cases, a drainage culvert was used to cross the road, as determined by a trail camera operated by [Pathways For Wildlife](#), an organization that studies habitat connectivity in California.

The remaining 35 bobcats that were collared for the California Bobcat Project crossed a variety other road type. These roads included tertiary roads between residential areas with a speed limit of > 25 mph, residential roads in neighborhoods with a speed limit of < 25 mph (Riley et al. 2014), and service roads, such as those on State Park or Forest Service land. Though vehicular strike was one of the more common causes of death for bobcats documented during the WHL mortality surveillance effort discussed above, none of the GPS-collared bobcats during the study were killed by vehicles, so it is challenging to determine the relative contribution of vehicular death to overall bobcat mortality in California.

In addition to crossing major roadways, three collared bobcats crossed major river systems. In Glenn County, a male bobcat crossed the Sacramento River

approximately seven times between May 2022 and February 2023, likely in locations where the river is narrow and sandbars or islands may make crossing easier. In Sacramento County, both male and female GPS collared bobcats crossed the American River. Those animals traveled through suburban areas and used either pedestrian footbridges or swam across the river.

4.3 Urbanization and Habitat Loss

Urbanization causes habitat loss and fragmentation for bobcats (Crooks 2002, Riley et al. 2003, 2010, Ordenana et al. 2010, Tracey et al. 2013), affecting their access to resources, movement, and survival (Riley et al. 2003, Poessel et al. 2014). The direct effects of urban and suburban development are the conversion of habitat to areas less suitable for wildlife use, as well as increased local human activity (Ordenana et al. 2010, Kozakiewicz et al. 2019). Indirect effects of urbanization include vehicular collisions, pesticide exposure, and increased disease exposure (Riley et al. 2004, Ordenana et al. 2010, Kozakiewicz et al. 2019).

An added effect of urbanization and development is the creation of barriers or obstructions to gene flow. Although an obstruction to movement might not be impervious to bobcats, it may be avoided, potentially leading to restricted dispersal, mating opportunities, and reducing overall gene flow between populations (Millions and Swanson 2007). Isolated populations are in turn subject to greater risks of inbreeding, genetic drift, and risk of extinction, as has been documented with mountain lions, another field occupying urban-adjacent habitats in California (Wootton and Pfister 2015, Gustafson et al. 2019, Ernest et al. 2014, Riley et al. 2014, Huffmeyer et al. 2022).

Bobcat response to urbanization is variable. Some bobcats move to areas of lower human density, or to the urban edge, (Tracey et al. 2013), while others have been documented to den and live in urban areas if prey is sufficient (Riley et al. 2010). While bobcats can adapt to urbanization (Crooks 2002, Riley et al. 2003, 2009, Gehrt et al. 2010, Ordenana et al. 2010, Tracey et al. 2013), adult females are thought to be most sensitive to the effects of urbanization (Riley et al. 2003). This sensitivity is important for population viability since adult females are responsible for population recruitment – if there are no adult females in an area, no new individuals will be born into the population (Riley et al. 2003). Land managers can mitigate impacts of urbanization by preserving large habitat areas in the urban wildland interface and increasing landscape connectivity (e.g., corridors, wildlife crossings, underpasses, etc.) between areas of remaining suitable habitat (Crooks and Sanjayan 2006, Ordenana et al. 2010).

4.4 Impacts of Climate Change

4.4.1 Climate Change

In California, climate change is expected to alter vegetative composition; increase wildfire frequency, size, and severity; increase variation in precipitation

with more extended droughts and periods of severe flooding; change the compatibility between species, their habitat, and essential resources; and exacerbate anthropogenic impacts on biodiversity (Swetnam and Betancourt 1998, Hannah et al. 2002, Westerling et al. 2003, Parmesan 2007, Williams et al. 2019, Huang and Swain 2022). Such changes will have direct and indirect effects on wildlife. Less heat-tolerant species may shift their range upslope to cooler climates or westward to areas with greater marine influence and lower temperatures (Hughes 2000, Mortiz et al 2008). Similarly, some bobcat prey species that are reliant on specific vegetative communities may shift their range to follow shifting plant ranges or suffer from reduced habitat in areas where plants cannot shift or adapt to hotter drier climates (Harrison et al. 2024; Schlaepfer et al. 2024).

While bobcats can survive in a wide range of habitats, they will likely be affected by climate change in several ways. They may lose preferred habitat or have to adapt to new spatial and temporal landcover patterns as a result of large-scale vegetation change due to warmer temperatures, increased drought, invasive species, and wildfire (Bachelet et al. 2001, 2016; Lenihan et al. 2003; Harrison et al. 2024). Some evidence suggests the warming climate in California is having larger effects on plant communities at lower elevations (Kavis et al. 2019; Zu et al. 2021; Harrison et al. 2024), where we found the highest densities of bobcats. Further, reductions in water availability may reduce the vegetative cover in riparian areas, which bobcats rely on for movement and hunting (Markovchick-Nicholls et al. 2008; Broman et al. 2014; Rich et al. 2018, 2019). Shifts in prey availability due to population decline or shifts in range could cause bobcat populations to decline. Female bobcats often respond to a lack of resources by having less frequent litters, and kitten survival can decrease when food resources are scarce (Bailey 1972, Crowe 1975, Koehler 1987, Larivière and Walton 1997). Bobcats may also shift their range and activity patterns due to excessive heat and changes in precipitation. These effects of climate change should be considered and monitored when conserving and managing bobcats in the future.

4.4.2 Wildfire

The response of carnivores to wildfire and the effects of wildfire on their populations vary by species, habitat type, fire size, fire severity, time since fire, and the nature of adjacent stands (Ketcham and Koprowski 2013, Jennings et al. 2016, Geary et al 2019, Furnas et al. 2022). Potential direct adverse effects of wildfires include mortality and injury from smoke inhalation and/or burns, while indirect effects may include a lack of food/prey availability, effective habitat loss, and increased vulnerability to predation due to the lack of cover and other postfire habitat changes (Ream 1981, Ketcham and Koprowski 2013). Conversely, as vegetation regenerates after a fire, structural and compositional changes can lead to an increase in prey diversity and availability, which helps bobcats and other carnivores (Doherty et al. 2022). However, as with carnivores, the response

of prey species to wildfire is moderated by the severity of the fire (Fontaine and Kennedy 2012).

Bobcat response to wildfire has not been well-studied, and most relevant studies were conducted 2-5 years post fire. Bobcats have been detected within burn scars, but the severity, frequency, and time since fire have a large impact on how bobcats respond. Higher severity or more frequent fires can lead to bobcats avoiding burned areas (Borchert 2012, Schuette et al. 2014, Geary et al. 2019). Low to moderate severity fires, such as with prescribed burns, can create habitat openings and edge habitat which bobcats may use for hunting (Little et al. 2018; McNitt et al. 2020). Bobcats may return to severe burn scars more slowly than other carnivores (Cunningham et al. 2006). As a result of climate change wildfires are becoming more frequent, larger, and more severe in California (Littell et al. 2009; Steel et al 2018; Safford et al. 2021). More research is needed on bobcat response immediately after fires, as well as over the long term and in various habitat types, to better understand how these changes will affect populations throughout the state.

During the California Bobcat Project, fewer bobcat detections occurred in areas that had burned within the last five years than in nearby unburned areas. We found that bobcat density was significantly negatively correlated with wildfire severity for at least two years (BCP report). Within areas affected by severe or catastrophic wildfire, a decline in bobcat densities can be expected and may persist for multiple years. With the current trends, bobcat populations will be at increasing risk from large, severe fires that directly threaten their health and change and/or limit their habitat.

Wildlife rehabilitation centers in California were surveyed for information about bobcats that had been admitted with injuries or burns after wildfires from 2020 - 2023. We found four instances of bobcats admitted to centers after fires in 2020 and 2021. A bobcat that was admitted to a facility in 2020 after a fire in Santa Cruz County was euthanized due to the severity of its burns. Three other burned bobcats were treated and eventually returned to the wild. All three bobcats had significant burns on the pads of their feet, one had burns on its legs, and another had burns on its ears.

4.3.3 Drought

Drought can be defined as “a deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage” (NOAA, drought.gov). Drought can be influenced by fluctuations in precipitation, humidity, air temperatures, solar radiation, wind speeds, soil moisture, and human water use (Hobbins et al. 2016, McEvoy et al. 2016). Determining the effects of drought on wildlife species is complicated by the physiology, life history traits, ecological niches, and preferred habitat of those species.

Standard precipitation evapotranspiration index (SPEI) is a drought monitoring index that includes the calculation of potential evapotranspiration (PET) that considers temperature and precipitation (Beguería et al. 2014, Van Den Bosch et al. 2024). A recent study used SPEI to summarize past and predict future (2050-2080) drought occurrences in the contiguous U.S. The authors predicted the highest increases in drought in the southwestern U.S. and estimated that the Sonoran Basin and Range ecoregion in southern California is projected to undergo a much greater likelihood of both annual and prolonged drought exposure (Van Den Bosch et al. 2024). Similar California-focused approaches can be used to help identify areas of likely future drought concern and help guide drought research on bobcats and other wildlife.

Bobcat presence is often correlated with increased water availability and riparian areas, especially in arid environments (Markovchick-Nicholls et al. 2008, Broman et al. 2014, Rich et al. 2018, Rich et al. 2019). Lack of water may result in poor or unsuitable habitat conditions for bobcats and changes in water availability may cause seasonal changes in habitat use. For example, a bobcat collared in January 2022, in the Mojave Desert as part of the California Bobcat Project used a home range area that did not have a year-round water source. By summer, when temperatures were regularly above 100°F, the bobcat left that area and began moving through areas occupied by other bobcats, until it was eventually found in August of the same year, dehydrated, emaciated, and near death. In areas such as the Mojave Desert ecoregion that are expected to experience high frequencies and intensities of drought in the future (Seager et al. 2007; Rapacciuolo et al. 2014), land and wildlife managers should consider tools to increase water availability for wildlife such as guzzlers or other artificial water catchments (Rich et al. 2019).

Chapter 5. Human-Bobcat Conflict

Human-wildlife conflict (HWC) is a negative interaction between humans and wild animals that can adversely affect both people and wildlife (Nyhus 2016). To address HWC issues specific to bobcats, we used a multifaceted approach including: 1) Analysis of statewide CDFW Wildlife Incident Reports (WIR), 2) Coordination with California Department of Food and Agriculture (CDFA) on domestic animals at risk of bobcat predation, and 3) Identification and description of common HWC mitigation methods.

5.1 California Statewide Wildlife Incident Reports (WIR)

CDFW's Wildlife Incident Report (WIR) system allows members of the public (referred to as the reporting party) to submit reports of human-wildlife conflict incidents to CDFW and allows CDFW biologists to document and track these incidents. Biologists also use the system to issue depredation permits for specific wildlife species causing property damage, including bobcats.

WIR incidents are classified under one of the following categories: 1) sighting (observation of wildlife not generally requiring a response), 2) general nuisance (undesirable interaction not involving significant property damage), 3) depredation or property damage (causing harm or damage to property, pets or livestock), 4) potential human conflict (perceived public safety issue). For incidents involving confirmed property damage (e.g., where a bobcat has attacked pets or livestock), the reporting party can request the issuance of a depredation permit, which, if issued, allows the permittee or their agent to kill the offending animal(s). Prior to the implementation of the online WIR system in 2017, there was not a centralized incident database, and depredation permits were issued manually by paper copies or PDFs.

There has been an increase in reporting of bobcat incidents in the WIR since the system went online in 2017 (Figure 6). However, the increase in incidents may stem from increases awareness and use of the WIR system as opposed to an actual increase in human-bobcat conflict incidents. The documented increase may also be related to a general (but inconsistent) increase in CDFW's capacity to document and respond to HWC incidents since 2017.

Bobcat reports tend to peak during fall, particularly around September and October when mating season begins and males are roaming in search of mates (Figure 7). Bobcat reports typically consist of about 5% of the total WIRs received and are much less frequent than reports for black bears, mountain lions, wild pigs, and coyotes (Figure 8).

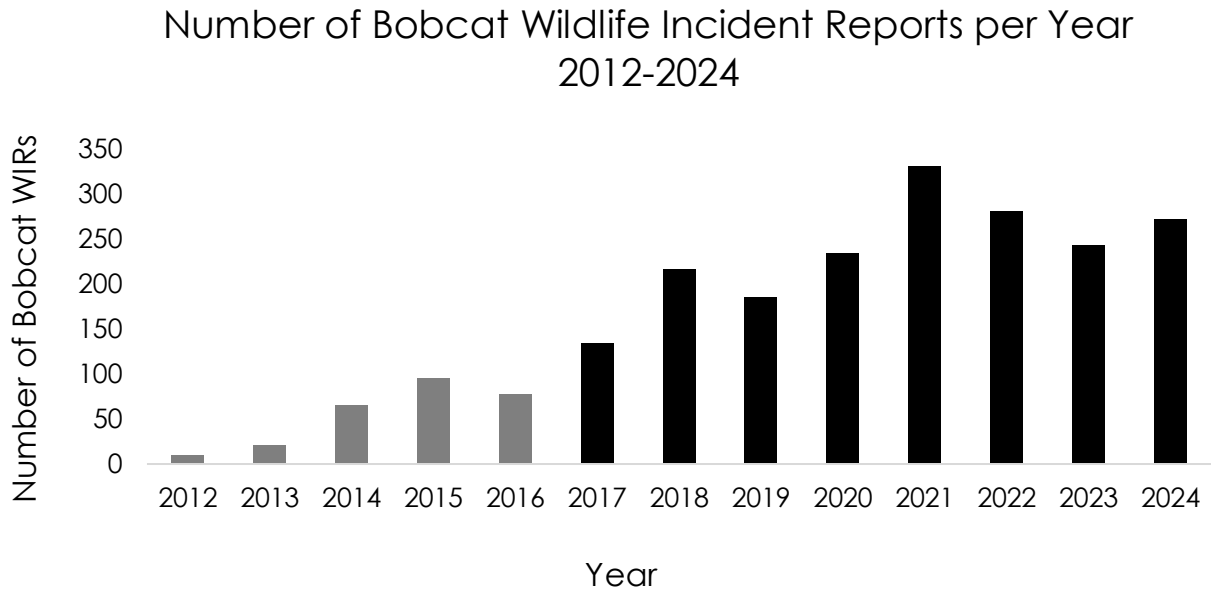


Figure 6: Number of bobcat Wildlife Incident Reports (WIR) collected by the CDFW Wildlife Health Laboratory between 2012 and 2024. The WIR system was published online for the first time in 2017, and the number of bobcat reports has increased since then.

1721

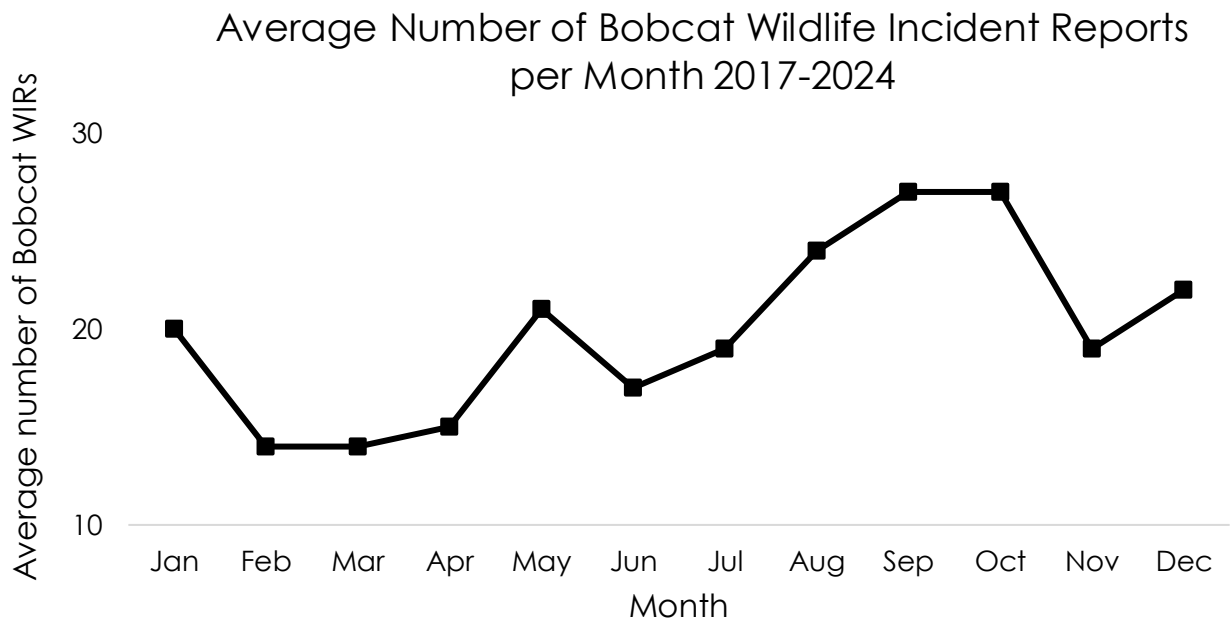


Figure 7: Average number of bobcat Wildlife Incident Reports (WIR) per month between 2017 and 2024.

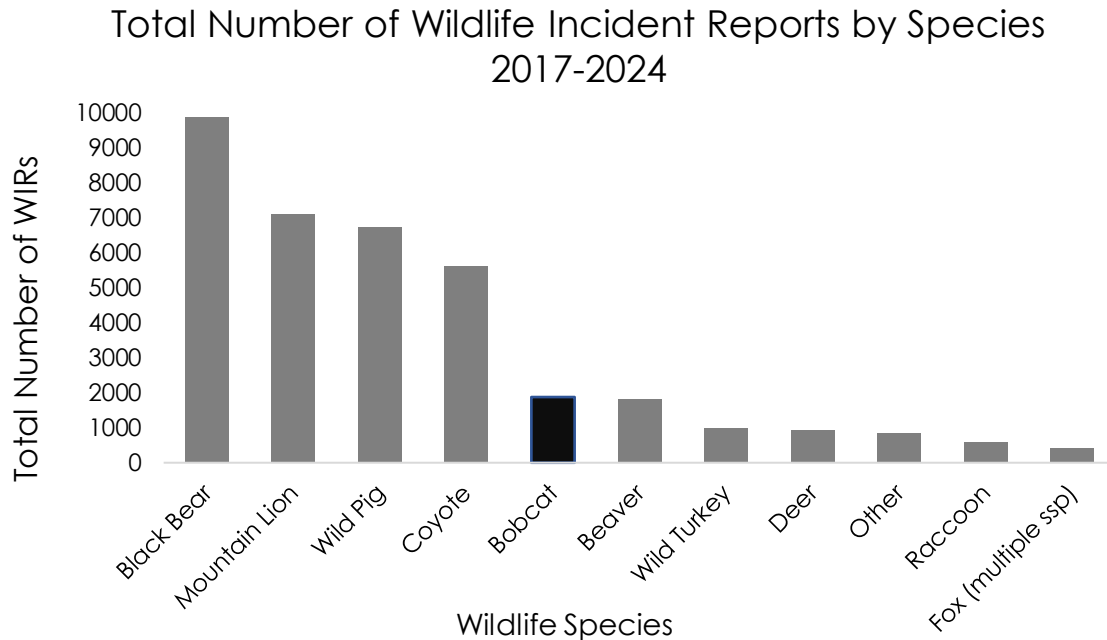


Figure 8: Total number of all report types for the top 11 categories of wildlife reported to the Wildlife Incident Report system between 2017 and 2024

Statewide, a total of 1,896 bobcat WIRs were recorded between 2017 and 2024; bobcat depredation accounted for 1,046 cases, 193 cases of general nuisance, 351 cases of potential human conflict, and 306 bobcat sightings were reported. Most bobcat incidents (55%) involve property damage (depredation category) such as loss of domestic chickens or ducks (Table 6). When a bobcat causes property damage, the reporting party may request a depredation permit from CDFW. Of these incidents, the property damage was confirmed, and a depredation permit was issued for 472 incidents (45% of depredation reports), of which 76 bobcats were reported killed. In those cases, damage to chicken and other domestic fowl made up a substantial majority of incidents (Table 6).

While most bobcat reports involve property damage, 28.7% were categorized as either “general nuisance” or “potential human conflict.” These often represent incidents where a bobcat is seen close to a residence or home and the reporting party is concerned about the potential for future property damage, conflict, or safety. CDFW biologists typically reach out to the reporting party and often perform site visits, to provide technical guidance and advice to minimize the likelihood of future conflict.

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1743 Table 6: Types of Property Damage reported in WIR between 2017 and 2024, for Bobcats.
 1744 A permittee can report multiple types of damage on one report (e.g. chickens, ducks,
 1745 pet cat, and pet dog were logged on to one report) but that person would only receive
 1746 one depredation permit. Therefore, the damages reported adds up to more than the
 1747 total number of permits issued.

Damage Reported	Number of Depredation Incidents Reported	Number of Permits Issued for Damage
Chicken(s)	405	275
Chicken Coop	20	8
Duck(s)	75	10
Goose (Geese)	26	12
Turkey(s)	25	4
Peacock(s)	9	3
Pigeon(s)	2	1
Rabbits(s)	12	4
Pet - Cat	34	15
Pet - Dog	18	6
Livestock - Sheep	8	4
Livestock - Goat(s)	19	9
Livestock - Calf/Lamb/Kid	1	1
Livestock - Llama(s)	1	1
Livestock - Other/Unspecified	17	18
Horse/Pony/Mule	1	1
Multiple damages reported	--	98
Total	673*	472

*All other depredation incident report numbers not accounted for here were listed without a specification for the damage done.

1748 Bobcat reports are most common from suburban centers in southern California,
 1749 the Bay Area, and populated areas in the Central Valley and adjacent foothills
 1750 (Figure 9). There are relatively few incident reports from remote areas, including
 1751 parts of the San Joaquin Valley and the Sacramento Valley, parts of the central
 1752 coast, the deserts, and parts of northernmost California (e.g., parts of the Modoc
 1753 Plateau and Klamath Mountains). Limited reports from these areas may be from
 1754 low human population density or a lack of awareness about reporting, or a
 1755 combination of these or other factors.

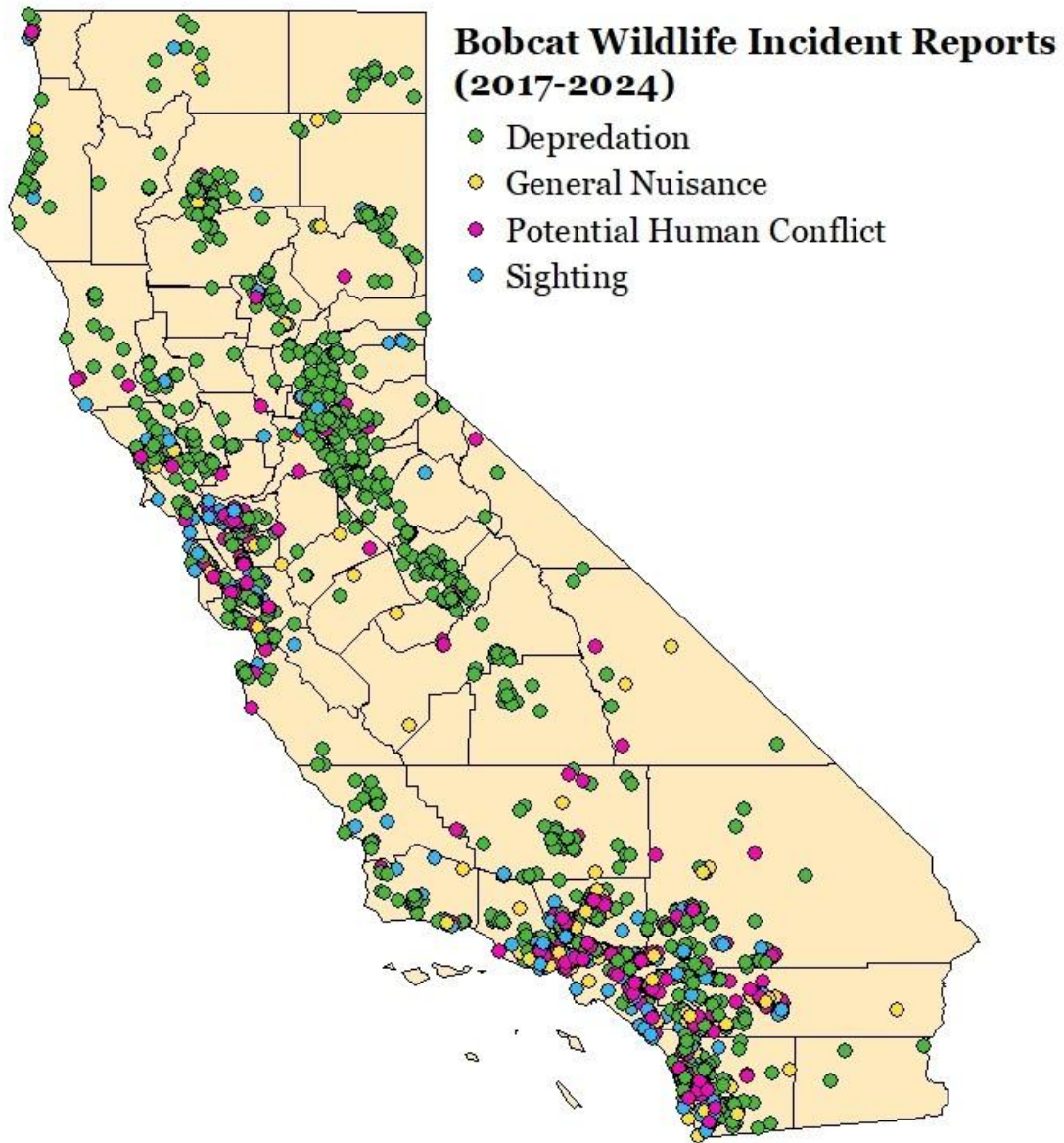


Figure 9: Map of CDFW Wildlife Incident Reports by incident category, for bobcats, submitted by the public from 2017-2024.

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1764 Table 7: Bobcat Depredation Reports Submitted, Depredation Permits Issued and Take
1765 Reported by County from 2017-2024.

County	Depredation Reports Submitted	Depredation Permits Issued	Take Reported
Alameda	13	2	0
Alpine	3	0	0
Amador	19	16	1
Butte	28	15	1
Calaveras	40	35	15
Colusa	2	1	1
Contra Costa	22	6	0
Del Norte	4	1	0
El Dorado	58	39	6
Fresno	18	14	5
Glenn	1	1	0
Humboldt	12	6	2
Imperial	3	1	0
Inyo	6	2	0
Kern	44	27	7
Lake	15	7	2
Lassen	37	36	4
Los Angeles	77	8	0
Madera	26	20	2
Marin	6	0	0
Mariposa	61	48	5
Mendocino	14	9	5
Merced	1	1	0
Modoc	11	10	0
Mono	1	0	0
Monterey	11	3	0
Napa	14	6	1
Nevada	23	15	1
Orange	8	0	0
Placer	34	26	1
Plumas	3	1	0
Riverside	49	10	1
Sacramento	8	4	1
San Benito	2	1	0
San Bernardino	53	12	3
San Diego	84	7	1
San Joaquin	10	2	0

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County	Depredation Reports Submitted	Depredation Permits Issued	Take Reported
San Luis Obispo	19	7	1
San Mateo	14	0	0
Santa Barbara	23	3	0
Santa Clara	18	6	0
Santa Cruz	7	2	1
Shasta	32	11	0
Sierra	1	1	0
Siskiyou	9	7	4
Solano	3	2	1
Sonoma	34	6	1
Stanislaus	4	2	0
Tehama	12	10	3
Trinity	4	2	1
Tulare	13	10	0
Tuolumne	7	3	0
Ventura	19	2	0
Yolo	1	1	0
Yuba	5	5	1
Total	1046	472	78

1766

1767 Before a depredation permit is issued, CDFW verifies bobcat damage, and
1768 generally documents any prior measures taken to prevent the damage and what
1769 corrective actions should be taken to avoid future loss. From 2017- 2022, 46.2% of
1770 permits issued described a chicken coop as a prior measure and 27.6%
1771 mentioned some other sort of fencing or enclosure (Table 8). Installing or
1772 reinforcing a chicken coop was the most suggested corrective action, followed
1773 closely by installing electric fencing.

1774

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1775 Table 8: Prior Measures Taken and Corrective Actions to be Taken for Bobcat
1776 Depredation Permits (for all bobcat permits issued and those resulting in take or killing of
1777 a bobcat), January 2017-June 2022.

	All permits	Permits resulting in take
Prior Measures Taken		
Chicken coop	139	31
Fencing or enclosures	106	30
Night penning	59	7
Penning livestock	31	8
Hazing	27	5
Electric fence	16	4
Dog or livestock guardian animal	14	5
Lights	12	1
Sprinkler	3	0
Music or radio	3	1
Alarms	1	0
Corrective actions to be taken		
Reinforce/repair fences/enclosures/coops	88	6
Install electric fencing	83	15
Use night penning	42	4
Install lights	29	2
Deterrence/hazing	25	2
Install noise or radio	13	2
Remove water attractants	12	0
Use dogs or livestock guardian animals	6	0
Trim vegetation and brush	5	1

1778

1779 5.2 Coordination with California Department of Food and Agriculture (CDFA)

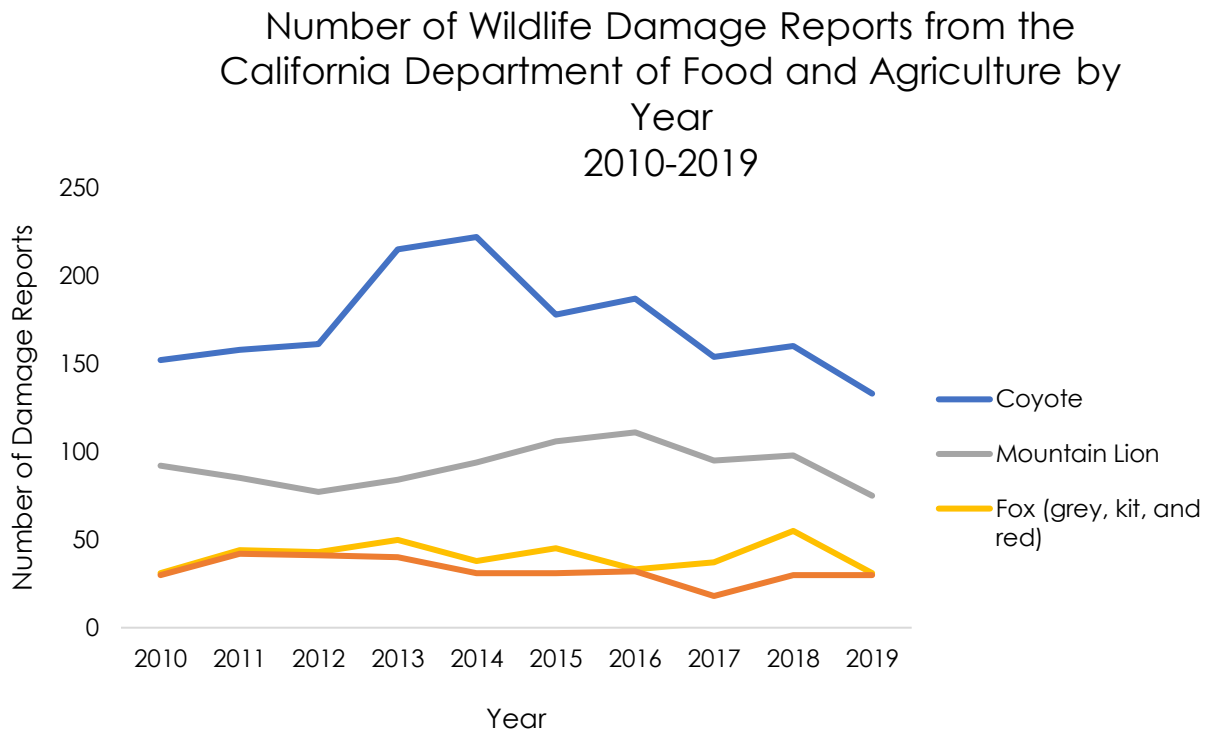
1780 FGC § 4158 directed CDFW to collaborate with CDFA to investigate nonlethal
1781 solutions to address bobcat depredation on chickens and other domestic
1782 animals. CDFW consulted with CDFA in [July 2023] about bobcat depredation.
1783 CDFA identified these species as needing protection from bobcats: California
1784 condors (held in outdoor rearing facilities or aviaries), chickens, ducks, geese,
1785 goats, guineafowl, peafowl, pheasants (domestic), pigeons, rabbits, sheep,
1786 swans, turkeys, and other companion/hobby animals. Additionally, CDFA
1787 suggested that in rare instances human health, safety, and property might need
1788 protection from bobcats.

1789 CDFA partners with USDA Wildlife Services to maintain a comprehensive database
1790 of wildlife damage to agriculture, human health and safety, property, and
1791 protected natural resources in California (CDFA 2023). This database includes

1792 verified wildlife damage incidents, and an estimate of any financial losses
1793 associated with each incident.

1794 From 2010 through 2019, CDFA recorded a total of 325 bobcat-related incidents,
1795 with 263 (80.9%) of those categorized as damage to livestock. For comparison,
1796 during the same period CDFA recorded 1,720 coyote-related incidents (Figure
1797 10).

1798



1799

1800 Figure 10: The number of damage reports by year recorded by the California Department
1801 of Food and Agriculture from 2010 to 2019 for coyotes, mountain lions, foxes, and
1802 bobcats.

1803 The most reported bobcat-related damage in the CDFA database, between
1804 2010 and 2019, was to domestic chickens, making up 42.8% (n=139) of all bobcat
1805 reports. The second most common damage was to companion animals such as
1806 pet cats, dogs, and rabbits (15%, n=49), followed by domestic ducks (11%, n=36).
1807 While the overall number of reports (n=325) and reporting trends for most species
1808 remained constant across the ten-year period, the number of damages to pets
1809 decreased, from a high of 11 reports in 2011 to a low of zero reports in 2018. In
1810 terms of hoof stock (goats and sheep), 78% of incidents involved juvenile animals.
1811 While lambs were damaged more often than goat kids, adult goats were
1812 attacked more often than sheep.

5.3 Non-lethal Mitigation Methods

There are techniques and products that can significantly reduce the risk of human-bobcat conflict and bobcat-related damage (Table 9). Regardless of the non-lethal method used, the goal is to reduce the accessibility of the resources to be protected (e.g., chickens, geese, rabbits, small pets, etc.) while ideally also increasing the bobcat's perceived level of danger or risk. As bobcats are obligate carnivores, they do not pose a significant threat to non-prey resources like crops, and the methods below are focused on protection of small animals.

CDFW and CDFA (written communication July 2023) recommend three primary approaches to non-lethally mitigating bobcat conflict:

- 1) 'Geographical methods' that make it harder or less appealing for bobcats to approach an area. Bobcats prefer brush, timber, rocks, and cover in general. If hiding and stalking cover is minimized on properties or areas near livestock and pets, bobcats are less likely to closely approach those areas.
- 2) 'Exclusion methods' designed to keep bobcats out of animal enclosures, typically involving woven-wire or similar barrier materials at least 8 feet (~2.4 meters) tall to deter bobcats from jumping over. Adding shade cloth to the entire barrier could help prevent the bobcat's natural sense of visual attraction to the movement of animals inside the enclosure. Keeping livestock and other animals within completely enclosed areas (i.e., including an overhead barrier) provides the highest level of exclusion.
- 3) 'Frightening methods' designed to make bobcats uncomfortable and decrease the appeal of any potential prey. Common examples include flashing lights or continuous bright lights, blaring music or talk radio, and livestock guardian dogs.

Geographical Methods. Geographic methods are the simplest, and often cheapest, way to discourage bobcat activity in a specific area. Bobcats are ambush hunters that typically stalk their prey from cover and use the element of surprise. Removing brush, bushes, timber, rocks, and other hiding places from the perimeter of the area to be protected can increase a bobcat's perceived level of danger and limit the amount of time it will be willing to spend investigating an area. Pruning dense vegetation and ground cover from the undersides of bushes and shrubs can reduce hiding cover, while keeping otherwise beneficial vegetative structures. At least 10 feet (~3 meters) is recommended between the fencing and any trees, or structures outside of the fencing that a bobcat could leap from, and at least 3 feet (~1 meter) between the fencing and any cover enclosed in the fencing, such as the chicken coop.

Exclusion Methods. Often the most effective solution combines both geographical and exclusion methods. To exclude bobcats, we recommend either a wire mesh fence or electric poultry netting. Wire mesh fences are highly effective, but they must be at least 8 feet (~2.4 meters) tall to reduce the likelihood

of bobcats climbing and/or jumping over them. Fences should have ½ inch or ¼ inch mesh; if the mesh is too big, bobcats and other dexterous predators, like raccoons, can grab domestic fowl through the openings. To increase the security of a wire mesh fence, consider the following modifications:

- Cover the enclosure with wire mesh or another structure.
- Use smaller mesh hardware cloth fencing.
- Bury the bottom of the fence several inches into the ground.
- Increase the fence height in drainage or valley areas of lower topography.
- Bury additional wire mesh perpendicular to the base of the fence.
- Install one or two electrified wires to the top of the fence.
- Add 90% shade cloth to the perimeter of the enclosure, which blocks the view of animals within.
- Install an outward facing or angled overhang at the top of the fence to make jumping over more difficult.
- Install pigeon spikes at the top of fence posts or flat surfaces that are part of the fence, to deter bobcats from jumping onto those areas.

Electric poultry netting can be an effective exclusion method. Kits available for purchase often include approximately 80 feet of 4-foot-tall netting along with either an AC or solar powered energizer and other necessary components. Although these fences are low, bobcats are still often deterred from the fence due to its electrification. Gates can be added to a poultry net fence to allow easy access for users. Electric poultry netting can be good solution in settings where an enclosure will need to be moved frequently. It can be rolled up and transported easily and does not require the sturdy posts and connecting infrastructure of a wire mesh fence. However, it does require routine maintenance to ensure nothing is interfering with the electrical current.

Keeping animals within enclosures only at night may also be effective. However, while bobcats and other predators typically hunt at night, they are often active during the day as well. A predator-safe chicken coop is only effective when the chickens are inside the coop. We strongly recommend enclosing the chicken coop and entire run (or similar resource) within the fencing and night penning within a predator resistant coop or similar enclosure. No matter what exclusion method is used, it is critical that protected animals stay inside the enclosure.

Frightening Methods. Frightening methods can be an excellent addition to any protective enclosure. However, these techniques are not designed to be the only defense against predators and are best used temporarily. Over long periods, their effectiveness can decline if bobcats and other predators become habituated to their presence and begin to ignore them. We recommend incorporating these methods when young animals are present, such as lambing or kidding seasons, or

1893 as a temporary solution while a longer-term solution is being installed. Loud music,
1894 bright lights, barking dogs, and human presence are all potential options. There
1895 are also several automated products that can be effective. For example, Margo
1896 Gadfly Critter Alarms produce loud sirens and flashing lights when motion is
1897 detected, and Foxlights produce randomly timed flashes of light over a 360-
1898 degree range. Motion-activated sprinklers may also frighten bobcats and other
1899 predators. There are many additional home security products that produce light
1900 or sound whenever motion is detected. Placing urine from another predator, such
1901 as wolf, around a fence line or other boundary may possibly deter bobcats;
1902 however, this method is not well tested and could potentially attract a bobcat or
1903 other carnivore to the area to inspect the scent. Predator urines can be bought
1904 online with dispensers that will slowly release the urine over the course of a month,
1905 so the scent remains strong. While this approach is untested in bobcats, it is
1906 relatively affordable and could potentially convince bobcats that a larger
1907 predator is in the area.

1908 Table 9: Summary of common mitigation methods.

	Category	Details	Estimated Cost
Remove cover and hiding places	Geographical	Remove all brush and hiding places to form a 10' buffer around the perimeter of the fence. Keep cover at least 3' from the inside of the fence.	Varies
Wire mesh fence	Exclusion	Must be at least 8' tall and ½ or ¼ inch mesh. Bury the bottom of the fence or add a top cover to increase security.	\$275 for 50 ft.
Electric poultry netting	Exclusion	Typically, 4 feet tall, and more portable than wire mesh. Requires routine maintenance to ensure nothing is blocking the electrical current.	\$320 for 82 ft.
Night penning	Exclusion	Not recommended as a stand-alone solution. Will increase security at night but leaves animals vulnerable to predators during the day.	Free
Motion-activated or random lights/alarms	Frightening	Not recommended as a stand-alone solution. Best used temporarily during times when young are present, such as lambing season, to increase security for more vulnerable animals.	\$30-\$120 each
Wolf urine	Frightening	Not recommended as a stand-alone solution. Best used temporarily during times when young are present, such as lambing season, to increase security for more vulnerable animals. Comes with month-long dispensers to distribute along the fence line.	\$40 per month

1909

Chapter 6. Historical Management, Legislation, Statutory and Regulatory Schemes, and Tribal Perspectives

6.1 Historical Management and Legislation Timeline

Bobcat management in California has changed over time, coincident with economic, statutory and regulatory changes. This section presents a detailed timeline of management approaches and changes over the last 100+ years.

Data on historical bobcat harvests and removals (Tables 10 and 11) is incomplete and is presented for specific periods in which it is available. For decades, California has maintained records of three types of bobcat take: 1) commercial harvest (take by a licensed trappers for purposes of commerce), 2) sport harvest (take by a licensed hunter with valid tags; furs could not be sold), and 3) depredation take (authorized take when property is being damaged or in danger of being damaged). However, tracking each of these types began at different times. Take has also occurred as part of government predator control programs.

Early trapping – 1920s: Bobcats have been trapped for their fur in North America since the arrival of European settlers; however, before the 20th century, records of bobcat and lynx harvests were combined as “wildcats”, making it difficult to interpret reports (Obbard et al. 1987).

1920s – 1960s: In 1920 as many as 12,500 bobcats were taken commercially in California for their fur in a single season. However, the demand for commercial fur declined after the 1920s, with 1,500-3,000 bobcats taken per season in the 1930s and 1940s. This downward trend continued through the 1950s and 1960s to less than 400 commercial harvests per year (Gould 1982).

- **1932** – California began a predator control program that employed state trappers to trap and remove predatory animals. This program continued through 1955 and operated in parallel with federal predator removal programs. The federal predator control program, called Animal Damage Control (ADC) program, began in 1915, and was originally housed in the U.S. Department of the Interior with the U.S. Fish and Wildlife Service. In 1986 ADC was transferred to the Animal and Plant Health Inspection Service (APHIS) under the U.S. Department of Agriculture and the name was changed to Wildlife Services in 1997 (Lee 1977, Hawthorne et al. 1999, Hansen 2007).

- **1955** – California state trappers removed 18,984 bobcats between 1932 and 1955. Federal trappers took 38,462 bobcats in California over the same period (Lee 1977).

- **1967** – Over the 67-68 season, CDFW (then California Department of Fish and Game), for the first time, used the Hunter Game Take Questionnaires to derive an estimate of hunter take of bobcats. Questionnaires were mailed to 1.8% of hunters, including some members from the California Varmint Hunters Association. Although a subset of Varmint members was surveyed there was

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- 1950 no knowledge of the complete number of animals or species taken by the
1951 group (Mallette 1969).
- 1952 o Results of the Hunter Game Take Questionnaire showed that 45,900
1953 bobcats were reported to be taken by licensed hunters. Along with
1954 licensed fur trapper reports and reports from animal control agencies, an
1955 estimated 48,400 bobcats were taken in the 1967-1968 season. Bobcat pelt
1956 prices were \$13.6 and increasing (Mallette 1969).
- 1957 **1970s:** The 1970s saw a nearly 3,000 percent increase in commercial bobcat fur
1958 harvest in California, from 319 taken by licensed fur trappers in 1970 to 9,595 in
1959 1980, when both fur prices and harvest began to increase in concert with rising
1960 demand for “luxury furs” such as mink, leopard, jaguar, cheetah, ocelot, panther,
1961 and fox, and a supply that was increasingly regulated in domestic and world
1962 markets (Gould 1982, Obbard et al. 1987).
- 1963 • **1971 – FGC § 4150** – In California, prior to 1971, bobcats were considered “non-
1964 protected mammals” and there were no restrictions on their harvest or take.
1965 In 1971 all non-protected mammals were designated “nongame mammals”
1966 in FGC § 4150. Subsequently they could only be taken or possessed in
1967 accordance with the Fish and Game Code or with regulations adopted by the
1968 Commission.
- 1969 • **1973** – On the Federal level, the United States became party to the Convention
1970 on International Trade in Endangered Species of Wild Flora and Fauna (CITES).
1971 The treaty restricted trade in endangered species and established procedures
1972 to monitor the trade of other species that might be faced with endangerment
1973 in the future. The Endangered Species Scientific Authority (ESSA) was
1974 established as the scientific body to monitor the bobcat's status in the United
1975 States, and the U.S. Fish and Wildlife Service (USFWS) was given authority over
1976 trade as provided in the treaty.
- 1977 • **1974** – California introduced a six-month bobcat season to provide them
1978 protection from harvest during the primary reproductive season. No bag limit
1979 or quota was set at that time (Lee 1977).
- 1980 • **1976** – California's season for take was further limited to 15 weeks (November
1981 16 – February 28), though pursuit by dogs (for the purpose of breaking, training,
1982 or practicing with dogs, providing that no bobcats were injured or killed) was
1983 permitted from March 1 through November 15. No bag limit was set (Lee 1977).
- 1984 • **1977** – The Commission enacted regulations that required pelts from bobcats
1985 taken for commercial purposes (Table 11) under a trapping license be tagged
1986 with a USFWS shipping (export) tag (Lee 1977).
- 1987 o California's first minimum statewide population estimate of 61,000 bobcats,
1988 from pre-breeding season, was made in the 1977-78 season. This estimate
1989 was based on data from trapper catch rates that were then extrapolated

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1990	to density estimates for major habitats in California, where the total acreage of that habitat was estimated and the bobcat density per habitat was calculated (Gould 1978).
1991	
1992	
1993	○ The Defenders of Wildlife petitioned the U.S. Fish and Wildlife Service (USFWS) to place the bobcat on the endangered species list. This action was taken because of the high demand and prices for bobcats at that time. The USFWS found that the petition was not warranted (Gould 1987).
1994	
1995	
1996	
1997	○ ESSA approved California's export quota of 6,000 bobcats. While the trapping season closed when incoming reports indicated the export limit had been reached, the final take was 8,000 due after all trapping reports were received.
1998	
1999	
2000	
2001	● 1978 – The export quota was again 6,000 bobcats. Hunters using hounds also took large numbers of bobcats in the late 1970's, including an estimated 16,564 individuals in 1977-78. The estimated combined harvest (hunting and trapping) in 1977-78 was 21,922 bobcats.
2002	
2003	
2004	
2005	● 1979 – The season was closed after only 11 weeks, when the quota of 14,400 bobcats was reached (Meshriy 2012).
2006	
2007	○ A requirement was established for returning the jaw of bobcats taken by trappers and hunters for investigation of age using cementum annuli analysis of their canine teeth.
2008	
2009	
2010	○ ESSA was dissolved and replaced by OSA (Office of Scientific Authority).
2011	● 1980s: For the 1980-81 season, the state was divided into three trapping zones, each with a different season length, depending on the status of the local bobcat population. The commercial quota of 6,000 export tags remained in place. For sport hunting, the quota per hunter was two animals for the 1980-81 season and increased to five for the 1984-85 season.
2012	
2013	
2014	
2015	
2016	● 1980 – Bobcat age and sex structure estimates indicated that populations in northeastern California were more skewed toward younger age classes than populations elsewhere in the state, indicating shorter life expectancies and a greater proportion of young of the year (Gould 1978). Sex ratios varied across study areas. The lowest take estimate in recent years was recorded, due to a reduction in sport hunting.
2017	
2018	
2019	
2020	
2021	
2022	● 1981 – Age data from jaw returns showed that survival for bobcats remained low in some counties of northeastern California while other counties showed improvement in bobcat age distributions. Declines in survival were found in some Southern California regions, particularly near the coast and were attributed in part to a shifting pattern of harvest pressure (Gould 1978).
2023	
2024	
2025	
2026	
2027	○ CDFW provided a population estimate of 74,700 bobcats and proposed a harvest limit of 14,500 bobcats to the OSA for the 1981-82 season. The
2028	

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- 2029 population estimate incorporated the findings of three movement
2030 studies among four bobcat populations conducted from 1976 - 1980 in
2031 four areas of California with variable bobcat harvest: Lava Beds National
2032 Monument in northeastern Siskiyou County (Zezulak 1980), Joshua Tree
2033 National Monument in northeastern Riverside County (Zezulak and
2034 Schwab 1980), near El Cajon (Lembeck 1978), and in the Laguna
2035 Mountains of southern San Diego County (Gould 1980).
- 2036 • **1982** – The observed trend in life expectancy among a sample of 8,177
2037 bobcats taken this year trended upward for 18 of 24 regions that had seen
2038 decreases in previous years. Sex ratios remained variable.
- 2039 • **1983-1985** – Analysis of jaws from harvested bobcats showed a continuing
2040 trend toward longer life expectancies and populations with more equal sex-
2041 ratios (Gould 1988).
- 2042 • **1986** –Federal regulations rescinded the requirement that all commercial and
2043 sport harvesters of bobcats in all states submit the lower jaw of harvested
2044 animals for age analysis.
- 2045 • **1987** – A final report on the Age and Sex Structure of Bobcats in California was
2046 completed (Gould 1988). The data showed a continued trend toward more
2047 stable bobcat sex ratios and age classes in 37 geographical areas of the State.
2048 The Bobcat Harvest Report (86-87) indicated the harvest had remained below
2049 14,400 since 1982-83. and recommended the end of statewide age and sex
2050 structure program. The jaw collection program ceased before the 1986-87
2051 season after harvest numbers declined and results showed continued healthy
2052 population age structures.
- 2053 **1993 – Assembly Bill (AB) 80** Banned the hunting and trapping of bobcats in
2054 California but failed to pass.
- 2055 **1998 – Proposition 4** was passed by California voters and prohibited individuals
2056 from using body-gripping traps for taking fur-bearing or nongame mammals for
2057 the purposes of recreation or commerce in fur (FGC § 3003.1). A body-gripping
2058 trap is one that grips the mammal's body or body part, including, but not limited
2059 to, steel-jawed leg-hold traps, padded-jaw leg-hold traps, conibear traps, and
2060 snares. Thereafter, trappers primarily used cages and box traps to capture
2061 bobcats. Proposition 4 also prohibited the use of steel jawed traps for nearly all
2062 purposes and prohibited poisoning animals with sodium fluoroacetate and
2063 sodium cyanide and taking fur-bearing or nongame mammals with the use of “.
- 2064 **2002 – Senate Bill (SB) 1645** (amended FGC § 4005, 4152, and 4180). This bill
2065 established prohibitions on the sale of fur taken by people providing trapping
2066 services for profit. It also required those who offered their trapping services for
2067 profit to obtain a trapping license issued by CDFW.

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2068 **2012 – SB 1221** (amended FGC § 3960, added FGC § 3032, 3960.2, 3960.4, and
 2069 3960.6, and repealed FGC § 4756). This bill prohibited the use of dogs in the pursuit
 2070 of bears or bobcats, with certain exceptions (use of dogs to pursue bears and
 2071 bobcats by agency law enforcement officers or employees, use of up to three
 2072 dogs for the pursuit of bobcats if specified under the conditions of a bobcat
 2073 depredation permit, or as a condition of scientific research authorized by CDFW.

2074 **2014 – AB 1213, The Bobcat Protection Act of 2013** (added FGC § 4155 4013). This
 2075 bill created a zone closed to bobcat trapping around Joshua Tree National Park
 2076 and required the Commission, commencing January 1, 2016, to consider whether
 2077 to prohibit bobcat trapping within, and adjacent to, preserves, state
 2078 conservancies, and any additional public or private conservation areas identified
 2079 to the Commission by the public as warranting protection.

2080 **2015** – The Commission adopted a statewide ban on commercial bobcat
 2081 trapping in August.

2082 **2019 - AB 273** (amending FGC §§ 3003.1, 3039, 4004, 4005, 4007, 4008, 4009.5 and
 2083 12002, added FGC § 4001). Prohibited the recreational and commercial trapping
 2084 of all furbearing and nongame mammals in California. AB 273 also eliminated the
 2085 Licensed Fur Trapper and Licensed Fur Dealer licenses previously issued by CDFW
 2086 and prohibited the sale of the raw fur of any fur-bearing mammal or nongame
 2087 mammal including those lawfully taken under previous conditions.

2088 **2019 – AB 44** (modified FGC § 3039 and added FGC § 2023). Prohibited the sale,
 2089 trade, or manufacture of fur products in California, including those from bobcats,
 2090 other nongame mammals, and furbearing mammals.

2091 **2019 – AB 1254** (amended FGC §§ 4152, 4153, 4154, and 4181 and added FGC §§
 2092 4156, 4157 and 4158). This bill made the sport hunting of bobcats unlawful,
 2093 allowed for the Commission, commencing January 1, 2025, to open a bobcat
 2094 hunting season in any area of the state determined by the Commission to require
 2095 a hunt. Before opening a bobcat hunting season in any area, AB 1254 required
 2096 the Commission, among other things, to adopt the Department's bobcat
 2097 conservation and management plan.

2098
 2099 Table 10: Bobcat Take in California between 1930-1976 by Licensed Fur Trappers, Hunters,
 2100 State Trappers, and U.S Fish and Wildlife Service and Average Price per Pelt (adapted
 2101 from Lee 1977 and historical CDFW Game Take Hunter Surveys).

Season	Average Price per Pelt	Licensed Fur Trappers (A)	Total Hunter Take (B)*	State Trappers (C)**	U.S. Fish and Wildlife Service (D)****	Total Annual Take (A+B+C+D)
1930-31	\$1.20	1,684		—	838	2,522
1931-32	\$0.90	1,250		—	865	2,115
1932-33	\$0.50	725		369	808	1,902

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Season	Average Price per Pelt	Licensed Fur Trappers (A)	Total Hunter Take (B)*	State Trappers (C)**	U.S. Fish and Wildlife Service (D)****	Total Annual Take (A+B+C+D)
1933-34	\$0.90	1,290		50	699	2,039
1934-35	\$0.80	1,436		50	802	2,288
1935-36	\$1.00	1,994		50	1,261	3,305
1936-37	\$1.00	2,650		421	1,416	4,487
1937-38	\$0.80	2,292		740	1,131	4,163
1938-39	\$1.00	2,254		1,123	1,465	4,842
1939-40	\$1.10	2,474		794	1,463	4,731
1940-41	\$1.70	2,776		1,017	1,400	5,193
1941-42	\$2.00	3,239		1,046	1,484	5,769
1942-43	\$2.70	1,923		718	1,317	3,958
1943-44	\$5.50	2,780		601	1,368	4,749
1944-45	\$3.10	2,063		545	1,162	3,770
1945-46	\$3.20	1,730		753	1,383	3,866
1946-47	\$1.60	1,072		1,194	1,817	4,083
1947-48	\$1.10	689		2,081	1,980	4,750
1948-49	\$0.70	510		1,459	1,969	3,938
1949-50	\$0.50	375		1,181	2,317	3,873
1950-51	\$1.00	293		1,255	2,195	3,743
1951-52	\$0.90	239		1,026	2,138	3,403
1952-53	\$1.50	336		919	2,867	4,122
1953-54	\$1.30	144		796	3,055	3,995
1954-55	\$1.50	223		796	2,965	3,984
1955-56	\$1.70	228		—	2,409	2,637
1956-57	\$1.30	276		—	2,823	3,099
1957-58	\$1.90	202		—	2,687	2,889
1958-59	\$3.10	222		—	3,444	3,666
1959-60	\$4.20	175		—	3,664	3,839
1960-61	\$4.70	304		—	3,364	3,668
1961-62	\$3.30	205		—	3,375	3,580
1962-63	\$2.80	295		—	3,366	3,661
1963-64	\$3.40	361		—	3,327	3,688
1964-65	\$4.20	221		—	2,742	2,963
1965-66	\$11.80	489		—	2,479	2,968
1966-67	\$8.00	241		—	2,386	2,627
1967-68***	\$13.60	276	45,900	287	2,094	48,557
1968-69	\$14.00	281		—	1,363	1,644
1969-70	\$10.60	588		—	1,697	2,285
1970-71	\$10.90	319		—	1,148	1,467
1971-72	\$18.80	588	25,400	—	936	26,924

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Season	Average Price per Pelt	Licensed Fur Trappers (A)	Total Hunter Take (B)*	State Trappers (C)**	U.S. Fish and Wildlife Service (D)****	Total Annual Take (A+B+C+D)
1972-73	\$29.30	686	34,700	—	599	35,985
1973-74	\$45.00	1,244	33,288	—	348	34,880
1974-75	\$50.50	1,393	24,790	—	319	26,502
1975-76	\$133.50	2,203	25,600	—	347	28,150

*Blank fields indicate that the information was not collected or is unknown.

**California predator control program 1932-1955.

*** In 1967-68, CDFW (then California Department of Fish and Game), for the first time, used the Hunter Game Take Questionnaires to derive an estimate of hunter take of bobcats (45,900). That year Mendocino County Animal Control Trappers reported taking 287 bobcats.

****Animal Damage Control Program, Fish and Wildlife Service, Department of the Interior.

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2104 Table 11: Estimated annual take of bobcats by hunting and trapping in California 1977 to
2105 2020

Season	Average Price per Pelt	Commercial Trapper Take (A)	Commercial Hunter Take (B)	Total Hunter Take (C)	U.S. Fish and Wildlife Service / Wildlife Services Take** (D)	Total Annual Take (A+B+C+D)
1976-77	\$76.00	5,000	400	20,377	347	26,124
1977-78	\$105.80	4,650	500	16,564	208	21,922
1978-79	\$120.00	6,825	1,500	5,811	56	14,192
1979-80	\$114.20	6,686	1,123	7,708	32	15,549
1980-81	\$129.90	8,702	893	3,737	24	13,356
1981-82	\$114.53	8,162	1,175	3,037	34	12,408
1982-83	\$105.85	7,427	1,086	2,951	48	11,512
1983-84	\$102.33	6,576	786	2,077	43	9,482
1984-85	\$121.96	7,495	1,402	2,993	48	11,938
1985-86	\$107.86	6,927	1,172	2,861	36	10,996
1986-87	\$167.33	8,003	1,120	1,739	44	10,906
1987-88	\$142.73	8,017	977	2,773	47	11,814
1988-89	\$102.31	4,877	709	1,778	52	7,416
1989-90	\$17.91	2,677	303	715	63	3,758
1990-91	\$49.50	962	186	881	46	2,075
1991-92	\$71.32	1,089	0	401	12	1,502
1992-93	\$43.92	1,039	0	342	48	1,429
1993-94	\$40.44	1,148	0	451	50	1,649
1994-95	\$24.72	1,319	0	488	62	1,869
1995-96	\$33.66	660	0	410	61	1,131
1996-97	\$75.24	1,066	0	429	78	1,573
1997-98	\$31.11	1,165	0	426	99	1,690
1998-99	\$30.55	224	0	353	113	690

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Season	Average Price per Pelt	Commercial Trapper Take (A)	Commercial Hunter Take (B)	Total Hunter Take (C)	U.S. Fish and Wildlife Service / Wildlife Services Take** (D)	Total Annual Take (A+B+C+D)
1999-00	\$32.06	182	0	352	97	631
2000-01	\$38.47	190	0	414	72	676
2001-02	\$66.00	214	0	295	71	580
2002-03	\$186.27	394	0	342	63	799
2003-04	\$148.75	429	0	268	65	762
2004-05	\$160.00	506	0	261	41	808
2005-06	\$194.50	627	0	265	46	938
2006-07	\$92.86	885	0	317	60	1,262
2007-08	\$134.57	641	0	336	74	1,051
2008-09	\$78.00	623	0	281	79	983
2009-10	*	457	0	251	54	762
2010-11	*	893	0	240	64	1,197
2011-12	\$362.68	1,499	0	255	59	1,813
2012-13	*	1,214	0	324	69	1,607
2013-14	\$390.00	1,292	0	308	39	1,639
2014-15	\$191.00	760	0	206	21	987
2015-16***	NA	0	0	263	17	280
2016-17	NA	0	0	265	16	281
2017-18	NA	0	0	311	12	323
2018-19	NA	0	0	328	12	340
2019-2020	NA	0	0	420	34	454

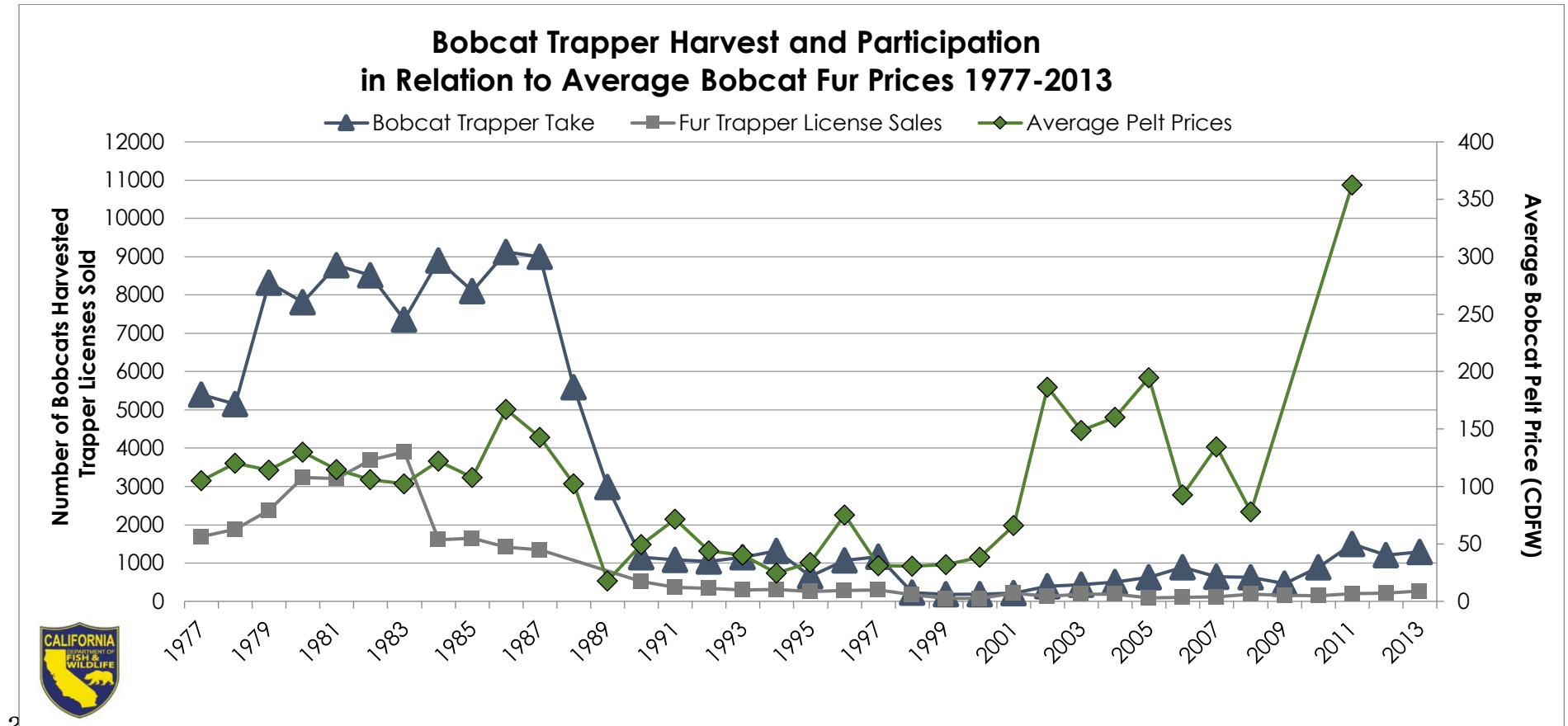
*Pelt prices were not reported for 2009-2010, 2010-2011, and 2012-2013

**In 1986 Animal Damage Control (ADC) Program was shifted from the Fish and Wildlife Service under the Department of the Interior to the Animal and Plant Health Inspection Service (APHIS). ADC was later named Wildlife Services in 1997. (Hawthorn et al. 1999).

***In 2015 the Commission adopted a statewide ban on commercial bobcat trapping in August.

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Figure 11: Bobcat trapper harvest and license sales in relation to bobcat pelt prices from 1977-2013.

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Bobcat Trapper Harvest and Participation in Relation to Overall Bobcat Take in California 1977-2013

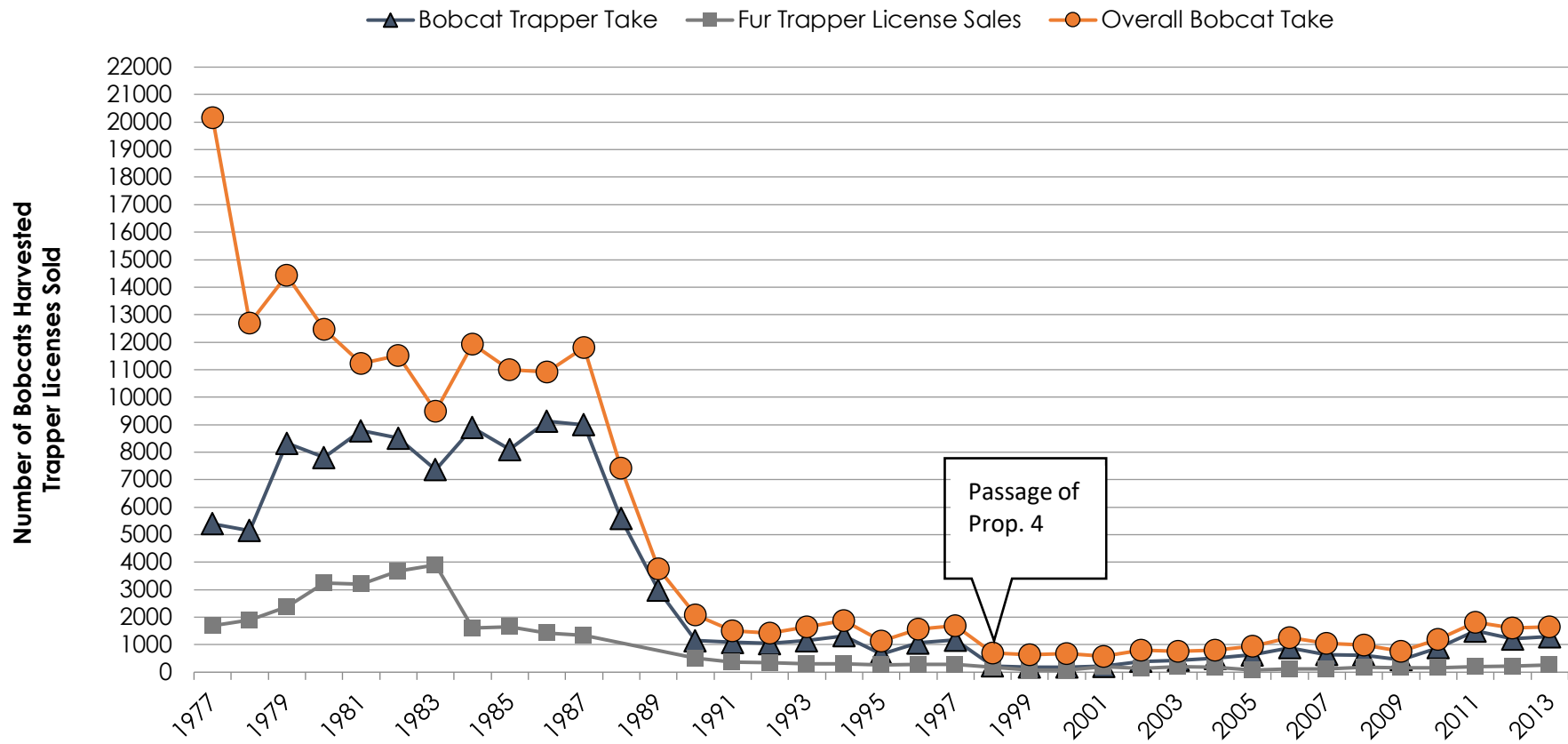


Figure 12: Bobcat trapper harvest and overall bobcat take in California, 1977-2013. **1998 – Proposition 4** was passed by California voters and prohibited individuals from using body-gripping traps for taking fur-bearing or nongame mammals for the purposes of recreation or commerce in fur (FGC § 3003.1).

6.2 Tribal Perspectives and Authority

California Native American tribes are the first peoples of California and continue to steward the lands they live on today. The ecological diversity of the regions contributes to the diversity of their cultures and languages. Tribes have shared the common value of a strong relationship with their natural surroundings, which has provided not only important resources for survival, but spiritual and cultural connections with the land (Rawls 1984). Communing with, tending to, and influencing the plant and animal communities around them, tribes used a variety of management and horticultural practices to ensure sustainable harvests while conserving and protecting natural resources (Anderson 2005).

Many California Tribes are still employing management practices that encourage connectedness to natural resources, and many tribal members provide conservation leadership for ecological science and conservation in their communities (Ramos 2021). Today, there are approximately 180 federally and non-federally recognized tribes on the California Native American Heritage Commission contact list in California and their historical knowledge, insights, and experiences with bobcats are valuable to CDFW and this plan. The names for bobcat in various California tribal languages include *Tunul* (Tachi Yokut Tribe), *Too'hoo oo* (Habematolet Pomo of Upper Lake), and *Mama'at* (Luiseño Indians) among many others.

It is the policy of CDFW to notify, consult, and promote collaboration and co-management with Tribes on proposed activities affecting bobcats and other wildlife (CDFW 2014). The California Natural Resources Agency (CNRA) is also committed to incorporating tribal perspectives and historical knowledge into scientific and political discussions.

In July 2023, CDFW notified all California Native American tribes of its intent to develop a statewide bobcat conservation and management plan in accordance with AB 1254 and requested their input via consultation. After further notifications, two online tribal listening sessions were held with tribes in August 2023. In total, CDFW received and acknowledged comments, interests, and views pertaining to bobcats from nine tribes: the Habematolet Pomo of Upper Lake, the Santa Rosa Rancheria Tachi Yokut Tribe, the Pauma Band of Luiseno Indians, the Agua Caliente Band of Cahuilla Indians, the Torres-Martinez Desert Cahuilla Indians, the Rincon Band of Luiseño Indians, the Morongo Band of Mission Indians, the Mono Lake Kutzadika Tribe, and the Mooretown Rancheria of Maidu Indians. That information is as follows:

- California Native American tribes are diverse and have a variety of perspectives with respect to bobcat conservation and management; however, overall bobcats and humans are viewed as intrinsically connected spiritually, culturally, and ecologically.

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- 2159 • There is a diversity of views among tribes pertaining to the ethics of bobcat
2160 hunting, but sport and subsistence hunting of bobcats are not common
2161 among California tribes.
- 2162 • Bobcats are part of some tribal creation stories, and they have important
2163 significance to some tribes as their hides were worn by shamans and used
2164 in the making of quivers for power and good luck.
- 2165 • Tribes expressed concerns about the ecological health of habitats
2166 supporting bobcats and other species, especially in the eastern portion of
2167 the state where bobcats are subject to different hunting regulations from
2168 neighboring states.
- 2169 • Tribes noted the need for clarifying the applicability of tribal ordinances to
2170 non-tribal people who hunt on tribal lands.
- 2171 • If there is not a greater need to set up areas and seasons of hunting
2172 bobcats as part of management or to mitigate human-bobcat conflict,
2173 then some expressed that hunting should remain unlawful on public lands.
- 2174 • Tribes expressed concerns over illegal hunting and poaching, and of
2175 hunters not following future conservation and management plan guidance
2176 and taking too many animals.
- 2177 • There is interest in combining CDFW wildlife research activities with tribal
2178 youth environmental education programs.
- 2179 • There is also interest in increased collaboration and co-management
2180 regarding conservation and management of bobcats and other wildlife
2181 species. This included discussion about the value of supporting, sustaining,
2182 and expanding the capacity of tribal wildlife research and management
2183 departments.
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Chapter 7. Hunting

To sustain populations, population recruitment (the addition of new members to the population) must equal population loss (mortality) over time. For bobcats, mortality results from natural causes like disease and competition and from anthropogenic causes such as vehicular strikes and hunting. While bobcat hunting does not currently occur in California, harvest was legal and regulated until 2019 (see Section 6.1).

CDFW's objective is to maintain healthy and sustainable statewide and regional bobcat populations throughout California. To help achieve this goal, we used population estimates and demographic parameters (e.g., estimated survival of different life stages) from published studies throughout North America to simulate the effect of different levels of anthropogenic mortality on bobcat populations. We then used these models to estimate sustainable anthropogenic mortality, or the number of bobcats that could die from anthropogenic causes without population decline. This method has been used in other areas to determine sustainable levels of hunting (Lehman et al. 2024). We considered anthropogenic mortality, such as hunting, authorized removal for depredation, vehicular strikes, and rodenticide toxicosis, as fully additive (causing the death of individuals that would otherwise have lived) rather than compensatory (causing the death of individuals that would have otherwise died from natural sources). The analysis is detailed in [BPM Report](#), Sections 3.11, 4.10, and 5.10.

We estimated that at annual adult and yearling survival rates above 0.78, bobcat populations would remain stable or grow. We estimated that populations would decline if adult and yearling survival dropped below 0.78 in unharvested populations and 0.75 in harvested populations. These predicted differences in the effect of survival rates on harvested vs. unharvested populations result from differences in predicted demographic structure, as our simulated harvested populations contained a greater proportion of yearlings and higher kitten survival.

If a population has a higher estimated survival rate than the minimum value required for stability, the difference between those values provides the proportion of individuals that can be sustainably lost to harvest mortality. This value could be multiplied by the estimated abundance from CDFW's SCR analysis to predict the estimated maximum sustainable number of bobcat harvest deaths among yearlings and adults in California and could help guide CDFW's recommendations for population management should a hunting or trapping season be opened.

The California Bobcat Project's survival estimate for collared adult animals during the study was 0.77 (90% credible interval: 0.66-0.89), slightly lower than the level we estimated to be necessary for population stability (above 0.78). Our estimate was similar to several prior localized California survival estimates, which ranged from 0.70 – 0.94 (Riley 2003, Riley et al. 2010, CDFW unpublished data; see Chapter

3.3 and Table 5 above). These studies were from specific localities and some variation in bobcat survival is expected throughout the diverse habitats and ecoregions of California. While the California Bobcat Project's estimate was derived from monitoring bobcats in disparate and diverse portions of the state, it was based on a small sample size (n=32) and biased towards Northern California and males. To refine survival estimates, CDFW will continue population monitoring at multiple established study sites across the state and will collaborate with other scientists studying bobcat biology in California.

Based on the bobcat density modeling from the California Bobcat Project, CDFW has estimated the bobcat population within California as well as at the ecoregional scale ([BPM Report](#), Sections 4.3, 5.3 and Table 16). We estimate there are currently over 62,000 bobcats distributed throughout California, and that number is similar to previous CDFW population estimates from 1977 and 1981. However, those prior population estimates lacked statistical rigor, and we are not confident of long-term population trends in the state. Systematic, long-term monitoring will be necessary to determine statewide and ecoregional population trends (Chapter 7, Goal 1).

As specified in FGC § 4157 (Chapter 1), before the Commission can open a bobcat hunting season in any area, it must consider the potential effects of such a season on bobcat populations, bobcats' wild prey, and other factors. It must also take several additional actions, including adopting this plan and considering the costs of personnel and management associated with the hunting of bobcats. If the Commission considers a hunting season in one or more areas, CDFW can develop or review draft proposals for the regulatory or statutory changes necessary to implement the hunt. CDFW can also estimate sustainable levels of anthropogenic mortality for specific populations based on the best available scientific data and methods used by other agencies and researchers. Such estimates could be used as a basis for CDFW to develop initial recommendations for allowable harvest, should the Commission open a hunting season. CDFW could develop bobcat management zone boundaries using ecoregions, habitat conditions and human development, land use patterns, and use its current estimates of sustainable mortality to develop harvest quota recommendations within zones. Per FGC § 4155, future zone and quota recommendations would include potential limitations near conservation areas such as parks, preserves, and conservancies.

If hunting were approved and implemented, CDFW could implement adaptive monitoring and management to inform adjustments to zones and quotas over time. To monitor the effects of any approved future hunting, CDFW recommends data be gathered from all participants after each season to assess levels of effort, levels of harvest, and the sex, age, and location of all harvested animals. Additionally, information collected at long-term monitoring sites stratified across

2274 management units would gauge the impacts of harvest on sex ratios, adult and
2275 yearling survival, and population estimates, and these would be periodically
2276 estimated and reported (i.e., approximately every five years depending on staff
2277 and funding).

Chapter 8. Guiding Principles, Strategies, and Adaptive Management Recommendations for Bobcats in California

Consistent with FGC § 4158, this plan and CDFW's future bobcat management will use the principles of "adaptive management." Adaptive management in natural resource management is an iterative process that recognizes uncertainty, tracks resource conditions and management actions, and uses what is learned as resources continue to be managed (Williams 2011). Bobcats occupy almost every habitat across California, a large and ecologically diverse state. Monitoring and management should be designed to conserve diversely structured bobcat populations, with all life stages present, across the state. The following broad goals and objectives have been designed to meet statewide monitoring, conservation, and management needs. As necessary, specific recommendations may be made at regional or population levels.

8.1 Goal 1: Monitor and manage bobcat populations for their long-term persistence in the face of changing environmental conditions

Objective 1.1: Monitor large-scale population and demographic trends and determine population structure over the long-term.

To facilitate long-term conservation, CDFW recommends implementing a long-term, systematic monitoring program to test model predictions from the California Statewide Bobcat Population Monitoring Project, determine large-scale population trends, assess demographic parameters and population structure, and monitor threats to population sustainability.

The long-term monitoring will use the same strategies as the original monitoring project, sampling a subset of 15 of the original 48 study areas each year, such that each is resampled on a five-year cycle. Study areas will vary in habitat type, climate, bobcat density, human use, and distance to urban development. Density and population sizes will be estimated at each study area and compared to earlier estimates, allowing us to see long-term trends in bobcat populations throughout the state, identify areas of conservation concern, and build management recommendations.

CDFW will also strive to collect more data on genetic diversity, reproductive success, kitten sex ratio, juvenile dispersal, survival rates for all life stages, population age structure, and population growth rates to determine population health and potential threats. These measures of life history traits and survival can be difficult to study and were not done so previously due to the learning curve of multiple teams across the state and the need to focus on camera and scat studies and population estimates. Moving forward, CDFW will be working with a smaller, highly trained team whose focus will be to bolster study protocols and dig further into these hard-to-reach data streams. This will be done by adding methods such as monitoring collared females more closely for denning behavior,

performing den site visits and monitoring dens through the kitten season, potentially deploying specialized break-away GPS collars on younger animals, and paying closer attention to aging animals at the time of capture.

Objective 1.2: Monitor health threats to bobcat populations.

Disease and non-target rodenticide exposure directly or indirectly contributes to mortality and in some cases can cause population-level impacts. CDFW will compile and analyze reports of any bobcat morbidity and mortality from regional staff, land managers, conservation partners, and the public. As part of CDFW's mandated responsibility to investigate wildlife diseases (FGC § 1008), it will work with partners, including but not limited to other wildlife and land management agencies, wildlife rehabilitators, and tribes to identify and diagnose the cause of any unusual clusters of bobcat illness or deaths occurring in a short period of time or in an area. CDFW will characterize disease and mortality events, working with local staff to conduct surveillance in the affected area, maintain a database of occurrence and outcomes of sick bobcats, assess if additional disease mitigation or conservation actions are warranted, and if indicated, issue recommendations to the public to keep people and pets safe.

CDFW will continue monitoring non-target rodenticide exposure and toxicity in bobcats to determine the effect of legislation to regulate and reduce AR use in California. Continued monitoring of mortality causes and disease surveillance will enable CDFW to understand the impact of both current and emerging pathogens (e.g., HPAI) that may spill over from other species and domestic animals and examine potential interactions with non-target rodenticide exposure. For any live-captured bobcats, biological samples will be collected at each bobcat capture and opportunistically when working with rehabilitation centers for disease analysis. All collared bobcats will be monitored for mortalities, and whenever possible will conduct an investigation and necropsy when a collared bobcat dies.

Objective 1.3: Gain a better understanding of how bobcat populations are affected by wildfires.

CDFW will conduct and support studies in areas affected by wildfire in California, especially in areas where pre-fire information on bobcat densities and habitat use exists.

In 2025, CDFW began monitoring bobcats at two study areas that had been subject to wildfire since they were surveyed as part of the California Bobcat Project. As soon as access to the burn area was granted, CDFW reestablished the original camera grids and scat transects, and also implemented trapping and collaring efforts. CDFW will monitor bobcat and other wildlife use of burn areas post fire and will be compared to the data that was originally produced for those areas. These data will provide insight into the extent of the threat wildfire poses to bobcats and their populations over time.

Objective 1.4: Gain a better understanding of how bobcat populations are affected by drought.

CDFW will conduct and support studies of bobcat habitat use and survival in drought-affected and drought-prone areas to better understand the effects of drought on bobcat population sustainability. We will use long-term data from study areas across the state to discern differences in local bobcat use and populations between drought and non-drought years. The results from these studies will provide insight into the effects of drought on bobcats in different habitats and parts of the state and help identify management strategies to mitigate adverse effects.

Objective 1.5: Continue tracking bobcat road mortalities and further assess habitat connectivity.

In areas where significant bobcat road mortality has been detected, CDFW will work with agencies and partners to monitor the frequency of bobcats killed by cars and any demographic trends among victims. CDFW bobcat staff will collaborate internally with the CDFW Connectivity Program and externally with partners such as the Department of Transportation to identify potential connectivity issues and monitor the long-term effectiveness of solutions. This may include deploying collars on bobcats near habitat connectivity hotspots that are currently being identified and conducting bobcat movement studies for future planning of wildlife crossings.

8.2 Goal 2: If the Commission establishes regulated bobcat harvesting in California, provide recommendations for implementation and management

Objective 2.1: Based on the best available scientific information, CDFW will provide recommendations for management zones and sustainable tag quotas.

Local bobcat populations can be affected by different stressors. To develop recommendations for a hunting program, CDFW will consider the status of bobcat populations on an ecoregional basis. The 19 ecoregions used for the California Bobcat Project could be used as the basis for developing management zones, or other ecoregional or zone approaches could be used.

Objective 2.2: Monitor hunted populations to ensure population sustainability.

CDFW will monitor bobcat populations before and after the establishment of any hunting seasons to ensure the health of those populations and assess effects of regulated harvest. Should monitoring show bobcat survival rates or other key demographic factors falling below sustainable levels, CDFW will develop and recommend modifications to harvest strategies and limits.

8.3 Goal 3: Provide consultation, collaborate, and support efforts to mitigate human-bobcat conflict

Objective 3.1: Work with local property owners, tenants, and stakeholders to reduce conflict with bobcats.

CDFW will continue its public outreach and educational efforts to minimize human-bobcat conflict and will partner with agencies and organizations to provide recommendations for reducing conflict. CDFW efforts will be focused on areas with higher conflict frequency. CDFW will continue to maintain and use its WIR database to document and monitor human-bobcat conflict trends and provide support and guidance to the public as needed. CDFW will provide up-to-date information about bobcats and bobcat conflict on its webpage.

Objective 3.2: Improve understanding of public opinion about bobcats.

CDFW will research how the California public values bobcats and whether public attitudes change over time, including social tolerance for human-bobcat conflict. CDFW may use public surveys and analyze social media postings to conduct this research.

Objective 3.3: Collaborate with wildlife rehabilitation centers to assess the effectiveness of bobcat rehabilitation.

CDFW is currently working with wildlife rehabilitation centers to study the survival and movements of injured or orphaned bobcats that are released back into the wild. CDFW works with these centers to take biological samples and morphometric measurements prior to release, the animal is fitted with an ear tag and CDFW aids in finding an appropriate location to release rehabilitated bobcats. Prior to release CDFW deploys cameras in the area and checks those cameras for some time post release, which enables an understanding of the wildlife community at release sites and monitors how long the released animal stays in the area. As appropriate and available, CDFW may also deploy GPS collars on rehabilitated bobcats to study their movements and survival post release. Over time these results will be used to inform best practices for rehabilitation and locations for release for the most positive survival outcome. CDFW also continues to coordinate with rehabilitation facilities to ensure humane and effective veterinary care for bobcats injured or displaced during wildfires or other emergencies.

8.4 Goal 4: Research bobcat diet and effects on prey

Objective 4.1: Study and support research on the effects of bobcat's prey species, including special-status and game species.

Objective 4.2: CDFW will study bobcat diets utilizing fecal DNA metabarcoding and collaborate with projects studying small mammal abundance to describe patterns of prey selection. Studies will also make correlations between bobcat diet, habitat factors, and rodenticide exposure.

8.5 Goal 5: Develop, enhance, and support communication and collaboration with tribes, stakeholders, agencies, and researchers regarding bobcat conservation and management

Objective 5.1: Partner with tribes, agencies, non-governmental organizations, and other partners to collaboratively conserve and manage bobcats.

CDFW will actively seek opportunities to partner with tribes, government agencies and departments, non-governmental organizations, universities, and others to collaborate on, 2) monitoring, 3) habitat improvement activities (e.g., prescribed fire, forest management, movement connectivity, climate adaptation), and 4) cultural programs and activities to benefit stable bobcat populations and minimize human-bobcat conflict (e.g., tools, education, and assistance to help secure domestic animals).

Consistent with policy (CDFW 2014), CDFW will continue to communicate and consult with tribes regarding regulatory change proposals and other decision-making processes affecting bobcats.

Objective 5.2: Communicate information about bobcats to the public and scientific community.

CDFW will maintain its website to include up-to-date information about bobcats in California and pertinent resources for the public. CDFW will produce an annual summary of its bobcat conservation and management efforts during the preceding year and post it online. The report will discuss emerging conservation or management issues and identify areas requiring new, focused research. If available and applicable, the report will include population estimates and trends and harvest statistics.

Additionally, the CDFW Statewide Bobcat Coordinator will regularly facilitate and lead meetings of a California Bobcat working group, consisting of CDFW biologists and subject area experts from universities, agencies, and NGOs, to discuss bobcat conservation issues including the implementation of this plan. CDFW bobcat staff will strive to publish their scientific findings and present them at scientific conferences and public meetings to disseminate useful and current information about bobcats.

Objective 5.3: Seek out and facilitate collaborative bobcat research in California.

CDFW will work internally and with agencies, universities, NGOs, and bobcat researchers to encourage scientific collaborations, data sharing opportunities, and complementary data collection efforts. Significant data on bobcats, co-occurring species, their habitat, and their prey are collected every year in California. By collaborating with others, CDFW will strive to ensure the most efficient use of resources and reduce redundancy in data collection. Through collaboration, more effective and efficient studies of bobcat biology and ecology can be conducted in California.

8.6 Goal 6: Periodically review and update the California Bobcat Conservation and Management Plan

CDFW will make minor revisions and updates to individual sections of this Conservation and Management Plan as necessary and as called for by latest information. For major updates or revisions (approximately every 10 years), CDFW will reach out to partners and the public to request new information, data, and other input. CDFW will also circulate a draft of each major update for peer, Tribal, and public review.

GLOSSARY

Term	Definition as Used in Plan	Source
Abundance	The total number of animals of a species in a given area.	Ruell et al. 2009
Adaptive Management	An iterative process that recognizes uncertainty, tracks resource conditions and management actions, and uses what is learned as resources continue to be managed	Williams 2011
California Native American Tribe	Federally recognized tribes and non-federally recognized tribes located in California that are on the contact list maintained by the CA Native American Heritage Commission for the purposes of cultural resources assessment and protection.	California Governor's Office of Tribal Affairs; Tribal Affairs – California Natural Resources Agency
Credible science	The best available scientific information that is not overly prescriptive due to the dynamic nature of science, and includes the evaluation principles of relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review of information as appropriate. Credible science also recognizes the need for adaptive management as scientific knowledge evolves.	FGC § 33
Commercial Take	Killing of a bobcat by a licensed commercial trapper wishing to sell or to transport a bobcat fur under authority of a USFWS CITES Export Shipping Tag	California Code of Regulations Tit. 14 § 467
Conservation	Maintaining and restoring the viability of ecological collectives that persist over time – namely, species and native populations and ecosystems. Conservation is a constituent element of sustainability.	Vucetich et al. 2018
Drought	A deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage.	NOAA, drought.gov
Ecosystem Based Approach	Takes into consideration that all components of the ecosystem, including its processes, structure, and conditions, are	CDFW SWAP 2025

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	interrelated, and should be maintained and enhanced to conserve ecological integrity and biological diversity.	
Home Range	The area an animal uses and travels for normal daily activity.	Anderson and Lovallo 2003
Population Density	The number of individual animals per unit area. Often reported as animals/ 100 km ²	Ruell et al. 2009
Spatially Explicit Capture-Recapture Model (SECR)	Statistical models used to estimate animal population density based on multiple detections of marked individuals which incorporate spatial data such as the locations of detections.	Royle et al. 2013
Sport Take	Killing of a bobcat by a licensed hunter with a valid bobcat hunt tag who is not permitted to sell or transport a bobcat fur.	California Code of Regulations Tit. 14 § 478
Wildlife Management	The management of rare and common habitats and animal populations for multiple uses at multiple scales to achieve ecosystem integrity and sustainable use of available resources.	Anderson et al. 2012

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