

MOUNTAIN LION FACT SHEET

Understanding Mountain Lion Management in Arizona

BACKGROUND

Mountain lion management is complex and requires the consideration of ecological and biological foundations along with the social and economic values of Arizona citizens. The Arizona Game and Fish Department (department) strives to implement management strategies that address the concerns and issues of wildlife managers and the vast array of public attitudes. The department manages mountain lions in a manner that maintains a viable, robust population using hunter harvest as one of the tools for management.

BEHAVIOR

Mountain lions may breed at any time of the year with kittens born in any month; however, in North America the majority of births occur from June through October (Laundré and Hernández 2007, Jansen and Jenks 2012). Females can first breed around 1.5 years of age while males first breed around their second year (Logan and Sweanor 2001). Litter sizes of 2-4 are common and many females raise kittens in consecutive years (Logan and Sweanor 2001).

Mountain lions are specialized top predators, and consequently, do not normally exist at high densities (Logan and Sweanor 2001). Despite having the broadest geographic distribution of any terrestrial mammal in the Western Hemisphere (Logan and Sweanor 2001), their elusive, solitary, and primarily nocturnal nature makes it rare to observe them in the wild. Mountain lions are stalk and ambush predators that hunt primarily at night and rely on ambush to kill their prey (Murphy and Ruth 2010). Adult mountain lions are primarily solitary and generally avoid each other except during breeding (Logan and Sweanor 2010). Although documented in and around wildland-urban landscapes, mountain lions tend to avoid human dominated-landscapes and interactions with humans (Kerston et al. 2011, Nicholson et al. 2014). This is one reason for so few reported mountain lion sightings (Riley and Decker 2000). While human encounters in Arizona are rare, conflicts can occur when people recreate in mountain lion habitat or when a mountain lion too frequently uses human dominated-landscapes. The department is committed to helping people learn how to behave responsibly and coexist safely in mountain lion habitat (<https://www.azgfd.com/wildlife/livingwith/mountainlions/>).

POPULATION

The mountain lion is a successful, far-ranging species that occupies a broad range of habitats in both temperate and tropic environments from the southern tip of Argentina in South America to northern British Columbia in North America (Culver 2010, Hornocker and Negri 2010, Laundré and Hernández 2010, Kerston et al. 2011). Breeding populations of mountain lions are known to occur in at least 16 western states (Larue et al. 2012). Since 1990, 10 additional states east of this range have reported mountain lion sightings, suggesting an eastward range expansion (Larue et al. 2012).

In Arizona, mountain lions are widely distributed and are expanding into previously unoccupied areas or areas where they were once considered to be only transient (Hoffmeister 1986). Before 2001, mountain lions in southwestern Arizona were rare. Now, it is not uncommon for biologists to observe mountain lion sign in those mountain ranges (Germaine et al. 2000, Smythe 2008, Naidu et al. 2011). It is most probable

that those mountain lions immigrated from adjacent populations (Germaine et al. 2000, Smythe 2008, Naidu et al. 2014). In general, the distribution of mountain lions in Arizona corresponds with the distribution of its major prey species, deer. The department is evaluating a technique that may be used to estimate mountain lion population size and currently estimates a minimum abundance of 2,500-3,000 mountain lions in the state.

DATA COLLECTION

Wildlife managers often use harvest data, specifically the sex and age composition of the annual harvest, to monitor long-term population trends and assure a science-based approach to regulating mountain lion harvest (Anderson and Lindzey 2005, Choate et al. 2006). These data are monitored by managers to ensure that the population maintains an appropriate composition of age classes of both sexes necessary for sustainable populations (Beausoleil et al. 2013). To collect harvest data, the department requires hunters who harvest a mountain lion to physically present to the department the skull and hide with proof of sex attached within 10 days of harvest. During this inspection, a premolar tooth is removed from each harvested mountain lion to accurately determine its age using cementum annuli analysis (similar to counting tree rings). Managers also collect tissue samples that may be used to genetically identify individuals, evaluate metapopulations, connectivity, dispersal and for other investigative purposes. The department uses harvest data and adaptive management, along with information acquired through research, to guide hunt management decisions and inform land management decisions such as transportation design, alternative energy projects, and urban and rural development planning.

MANAGEMENT ZONES

The department has established two mountain lion management zones referred to as the standard and minimal occurrence zones (Figure 1). In establishing these zones, the department recognized that mountain lion distribution varies in density across habitats, and because mountain lions are wide-ranging animals, that their management requires a landscape level approach (Cougar Management Guidelines Working Group 2005, Arizona Game and Fish Department 2009; 2015, Jenks 2011). In addition, establishment of these zones was based on an understanding that some parts of the state, and their prey populations, could support a higher mountain lion density than others. The objective in the standard management zone is to maintain sustainable mountain lion populations and provide hunting opportunities while minimizing negative impacts on prey species. In some areas of the southwest, increased harvest of mountain lions has contributed to higher growth and productivity of prey populations (McKinney et al. 2006, Rominger and Goldstein 2009, Stephenson et al. 2011). The standard management zone encompasses most of the state and has a bag limit of 1 mountain lion per hunter per calendar year.

The minimal occurrence zone is comprised mostly of the southwestern portion of the state and consists of units where historical mountain lion populations have been very low or non-existent. In the minimal occurrence zone, management of other wildlife species is a higher priority and mountain lions are managed for low densities. This zone, to keep densities low, and because increased hunting pressure can decrease mountain lion density and productivity, has a bag limit of 3 (Stoner et al. 2006, Hurley et al. 2011).

In both zones it is illegal to harvest mountain lion kittens or females accompanied by kittens. In either zone, restricted seasons and adaptive management may be used to address specific needs and meet management objectives.

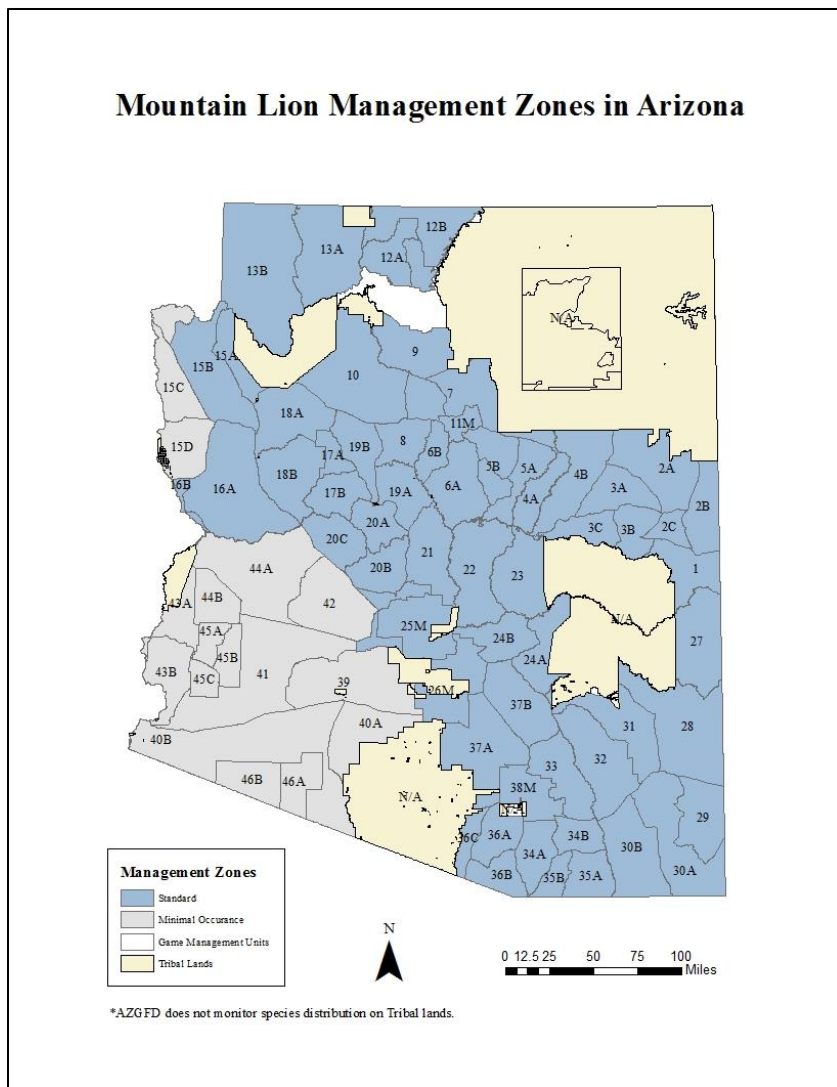


Figure 1. Mountain lion management zones in Arizona.

ADULT FEMALE MANAGEMENT

When adult female mountain lion harvest represents a substantial portion of the total harvest a decrease in mountain lion abundance often occurs, suggesting that the proportion of adult females in the harvest may be a useful indicator of trends in hunted populations (Anderson and Lindzey 2005, Stoner et al. 2006). In the minimal occurrence zone where the goal is to manage for low densities, the sex and age of the mountain lion harvest do not apply in determining annual harvest of mountain lions. However, the management objective in the standard management zone is to protect the adult female segment of the population. The department evaluates and manages adult female harvest using 6 zones which encompass multiple game management units (Figure 2). These zones are delineated by landscape features that may present barriers to dispersal, both natural (e.g. rivers, canyons) or manmade (e.g. highways, canals). Statewide harvest trends will be managed to keep adult female harvest < 35% of the total take within the standard management zone. Should the 2-year mean adult female harvest comprise >35% of the total harvest for a zone, female harvest limits or shortened hunt structures may be established to reduce the overall female harvest in that zone. Since implementation in 2011 we have never exceeded the 35% threshold. The 2-year mean adult female harvest in each zone typically ranges from 0% to 30% (Table 1).

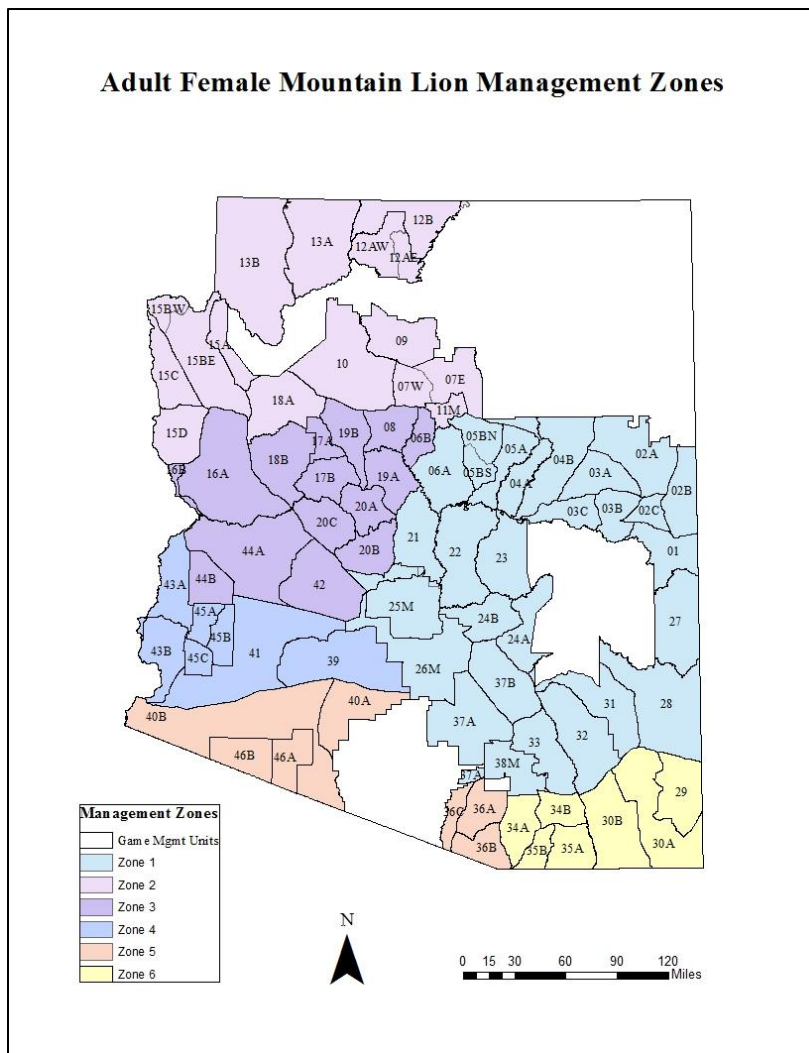


Figure 2. Adult female mountain lion management zones.

2-Year Mean Adult Female Harvest

Zone	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
1	15.58%	20.33%	21.25%	18.06%	19.01%	14.94%
2	23.81%	23.53%	15.48%	14.86%	19.75%	20.45%
3	16.82%	19.23%	29.11%	24.68%	18.67%	19.28%
4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
5	30.00%	20.00%	18.52%	6.90%	13.16%	23.08%
6	26.32%	26.09%	27.27%	25.00%	21.74%	20.78%

Table 1. Two-year mean adult female harvest for the 6 adult female management zones, 2009-2015.

It is legal to use hounds to hunt mountain lions in Arizona, and this hunting method is an effective way to reduce female harvest. Over the past 10 years, Arizona hound hunters were significantly more selective than hunters without hounds, with hound hunters harvesting more males (about 64%) than females while hunters without hounds harvested more females (about 63%) than males. The use of hounds has had a positive impact on harvest selectivity, hunter success, population composition, and ultimately, success of the species.

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