

**SPECIES: Mountain Lion**

Goal: Manage the mountain lion population, its numbers and distribution, as an important part of Arizona's fauna and to provide mountain lion hunting recreation opportunity while maintaining existing occupied habitat and the present range of mountain lions in Arizona.

**MOUNTAIN LION APPROACHES**

1. Maintain annual harvest of 250 or greater (including depredation take). Use age and sex harvest data to assure that populations remain at sustainable levels.
  - Sportsmen harvested 324 mountain lions in 2015, compared to 233 in 2014. An additional 33 lions were reported harvested under the depredation statute (ARS 17-302) and 3 reported as other (road kill or nuisance lethal removal).
  - From 2011-2015 Arizona hunters have harvested an average of 276 mountain lions annually, with a range of 233–324.
  - In 2015, female mountain lions represented 47% ( $n = 152$ ) of the total hunter harvest ( $n = 322$ ).
2. Provide recreational opportunity for 6,000 or more hunters per year.
  - In 2015, the Department provided mountain lion recreational opportunity to 10,813 hunters. Many that purchase lion tags do so hoping to encounter a mountain lion during other hunts. Incidental harvest represents a small percentage of annual mountain lion harvest.
3. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat and maintain linkages between habitats.
  - The distribution of reported hunter, depredation kills, research effort and incidental surveys support the accomplishment of this objective.
4. Maintain a complete database from all harvest sources, through a mandatory checkout system, including age, sex, and harvest location to index population trends.
  - We maintain a complete database for harvested lions from 1981 to the present. All hunter-harvested mountain lions must be physically checked by the Department.
5. Identify important habitats and travel corridors for lion populations. Ensure protection and improvement where possible, through cooperation with land management agencies and other landowners; manage from a landscape perspective (1.A.1–1.A.6, 2.D.1–2.D.3).
  - A number of research studies and monitoring projects are collecting ancillary movement information throughout Arizona's mountain lion range.
6. Determine population characteristics on a Lion Management Area (LMA) basis. The Department may need to manage for lower population levels prior to initiating translocations of other game species or following prey population declines or disease outbreaks (1.A.1–1.A.6).
  - Efforts continue for determining population relatedness using genetic samples obtained from the hunter harvest and radio-marked animals.
7. Implement hunt structures to increase and direct harvest emphasis toward areas with high lion populations, and where depredation complaints are substantiated, and evaluate the effectiveness of these efforts (1.A.1–1.A.6, 1.B.6–1.B.9).
  - The use of multiple bag limits as a management tool is still in effect. Multiple bag units are evaluated for removal or addition annually on the basis meeting management objectives for

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- recently translocated populations of bighorn sheep, declining populations of bighorn sheep, or bighorn sheep populations below management objectives.
- The Department offered 8 multiple bag limit mountain lions hunts in 2015-2016. The multiple bag limit was not reached in any hunts.
8. Continue to increase public awareness of mountain lions and their habits, to reduce conflicts with humans and other wildlife in accordance with Department policy (2.A.1–2.A.6); hunter opportunity will be the preferred method to mitigate conflicts.
- The Department continues its’ public awareness campaign by:
    - Media releases both statewide and locally
    - Distributing the “Living with Mountain Lions” pamphlet
    - Expanding the mountain lion school curriculum education program
    - Developing a mountain lion management information sheet
    - Updating our mountain lion website
9. Manage in alignment with the Department’s Predation Management Policy (1.A.1–1.A.6).
- The Commission's Predation Management Policy is being used to address mountain lion predation through site-specific predator management plans.
  - Developed one predation management plan for mountain lions in Unit 16A.

**PROJECT ACTIVITIES**

Trends in mountain lion harvests often reflect population growth, stability, or decline in Arizona when compared to hunter effort and tag purchases. Mountain lion population trends usually follow prey population trends and take about 2 generations (4 years) to react to changes in prey numbers. Based on biological evidence that include genetics and harvest trends, mountain lion populations in Arizona are increasing. Arizona’s management strategy is to protect the adult female segment of the population in areas where we are meeting prey population objectives. Should female harvest comprise >35% of the total harvest for a group of units that biologically may be combined as a zone, female harvest limits may be established in that zone. Female harvest limits may restrict the legal take to male only or close units to all mountain lion take as appropriate. Using interstate highways as barriers to dispersal, adult female harvest management zones were designed for analyzing adult female harvest. Since implementation in 2011, adult female harvest has not exceeded 35% in any zone.

Annual mountain lion tag sales and harvest information, 1977–2015.

Year	Tags Sold		Harvest			Total
	Resident	Non-Resident	Hunter <sup>1</sup>	Depredation	Other	
1977	7355	143	248	4		252
1978	7848	116	229	12		241
1979	7836	102	283	7		290
1980	7697	102	204	2		206
1981	7759	102	191	9	1	201
1982	7979	90	316	8	1	325
1983	6934	70	221	7	1	229
1984	6785	91	184	9		193
1985	7447	76	245	19	7	271
1986	7876	60	191	25		216
1987	8228	76	205	31	5	241

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Year	Tags Sold		Harvest			Total
	Resident	Non-Resident	Hunter <sup>1</sup>	Depredation	Other	
1988	8396	99	184	24	1	209
1989	3603	67	130	65	1	196
1990	2972	74	188	40	1	229
1991	2959	78	179	25	1	205
1992	2904	87	200	28	5	233
1993	3307	100	186	38	2	225
1994	4070	149	215	32	6	253
1995	4689	170	234	31	1	266
1996	5420	132	225	38	2	265
1997	5521	136	267	47	3	317
1998	6435	155	289	52	1	342
1999	6727	158	246	47	2	295
2000	7316	162	276	53	1	330
2001	7944	165	326	58	0	384
2002	8105	169	264	50	5	319
2003	7942	147	218	63	12	293
2004	8811	153	247	31	1	279
2005	9977	140	204	41	0	245
2006	10770	150	221	36	5	262
2007	10839	156	250	28	5	283
2008	10561	152	265	42	5	312
2009	10330	137	249	29	5	283
2010	10120	145	247	31	7	285
2011	10133	159	288	38	4	330
2012	10759	182	235	37	4	276
2013	10736	215	302	41	1	344
2014	10852	272	233	33	2	268
2015	10485	328	324	33	3	360

<sup>1</sup> Hunter harvest was derived from mandatory checkout 1987–present.

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Mountain lion information from mandatory checkout and stock killing reports, 2015 calendar year

Unit	Harvest			Harv. Using Dogs	Hunter Harv.		Adult Females >= 3 yrs	Month of Hunter Harvest			
	Hunter	Depredation	Other		Male	Female		Jan to Mar	Apr to Jun	July to Sep	Oct to Dec
1	9	0	0	4	7	2	1	4	0	2	3
02B	2	0	0	2	1	1	0	2	0	0	0
03C	5	0	0	5	4	1	0	2	0	0	3
04B	1	0	0	1	1	0	0	0	0	0	1
05A	1	0	0	1	0	1	0	0	0	0	1
05B	7	0	0	5	2	5	2	4	0	0	3
06A	5	0	0	1	2	3	2	2	0	1	2
7	3	0	0	3	2	1	1	3	0	0	0
8	7	0	0	6	4	3	2	4	1	0	2
9	7	0	0	6	4	3	1	3	0	0	4
10	2	0	0	2	1	1	0	2	0	0	0
11M	2	0	0	1	0	2	2	1	0	1	0
12A	20	0	0	19	9	11	2	11	2	0	7
13A	2	0	0	1	1	1	1	0	0	0	2
13B	8	0	0	5	4	4	2	3	0	0	5
15A	1	0	0	1	1	0	0	0	0	0	1
16A	3	0	0	2	3	0	0	1	0	0	2
16AS	1	0	0	1	1	0	0	1	0	0	0
17A	5	0	0	4	2	3	1	1	0	0	4
17B	13	0	0	13	10	3	2	10	2	0	1
18A	7	0	0	7	4	3	1	6	0	0	1
18B	4	5	0	4	2	2	0	3	0	0	1

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18BS	1	0	0	0	0	1	0	1	0	0	0
19A	5	1	0	4	2	3	2	1	1	2	1
19B	6	0	0	4	3	3	0	3	0	1	2
20A	1	0	0	0	0	1	1	0	0	0	1
20B	3	0	0	2	3	0	0	1	0	0	2
20C	3	0	0	3	2	1	1	1	1	1	0
21	7	0	0	1	2	4	0	0	0	0	7
22	10	0	0	7	7	3	0	7	0	0	3
23	18	0	0	17	11	7	1	9	2	0	7
24A	9	0	2	5	6	3	1	3	0	1	5
24B	1	0	0	1	1	0	0	0	0	0	1
27	10	1	0	7	8	2	1	3	1	0	6
27L	1	0	0	1	0	1	1	1	0	0	0
27U	2	0	0	2	1	1	0	2	0	0	0
28	1	10	0	1	0	1	1	1	0	0	0
28L	1	0	0	1	0	1	0	0	1	0	0
29	4	0	0	4	2	2	1	4	0	0	0
30A	8	0	0	6	3	5	2	6	0	0	2
30B	3	0	0	2	1	2	0	1	2	0	0
31	6	5	0	6	4	2	1	0	2	0	4
32	11	11	0	10	6	5	1	7	1	0	3
33	21	0	0	14	8	12	5	9	1	2	9
34A	10	0	0	4	4	6	3	2	0	1	7
34B	4	0	0	3	3	1	1	1	0	0	3
35A	9	0	0	5	4	5	1	2	3	1	3
35B	8	0	0	6	4	4	2	4	1	0	3
36A	6	0	1	4	5	1	1	2	1	0	3
36B	7	0	0	4	2	5	1	0	2	1	4
36C	8	0	0	7	3	5	3	4	1	0	3
37B	11	0	0	9	3	8	1	6	1	0	4
39	1	0	0	1	1	0	0	1	0	0	0

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42	2	0	0	0	0	2	2	2	0	0	0
44A	2	0	0	0	1	1	0	1	0	1	0
<b>Total</b>	<b>324</b>	<b>33</b>	<b>3</b>	<b>247</b>	<b>170</b>	<b>152</b>	<b>54</b>	<b>151</b>	<b>26</b>	<b>13</b>	<b>134</b>
Percent	90	9	1	76	53	47	43	47	8	4	41

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**REGIONAL SUMMARY**

**Region 1**

Hunters harvested 37 mountain lions in Region 1 in 2015.

Mountain lions harvested by hunters in Region 1 during 2015.

Unit	MBL	Total # Lions Harvested	Male	Female
1		16	11	5
2A		0	0	0
2B		2	1	1
2C		0	0	0
3A		0	0	0
3B		0	0	0
3C		5	4	1
4A		0	0	0
4B		1	1	0
27		10	8	2
27L	10	1	0	1
27U	8	2	1	1

Region 1 has 2 hunt areas with multiple bag limits; Upper Blue River Hunt Area and Lower Blue River Hunt Area in Unit 27. The Region established both to increase Rocky Mountain bighorn sheep populations with the following site-specific objectives:

The recommended triggers to initiate and/or discontinue the Upper Blue River multiple bag limit hunts are as follows: Initiate and/or continue the multiple bag hunt as long as the estimated sheep population is below 225 or there are two or more consecutive years with lamb recruitment below 35% at the time of survey in October/November. The MBL for this hunt area is 8. In 2015, 2 lions were harvested from the Upper Blue River multiple bag limit area in Unit 27 (1 male, 1 female).

The recommended triggers to initiate and/or discontinue the Lower Blue River multiple bag limit hunts are as follows: Initiate and/or continue the multiple bag hunt as long as the estimated sheep population is below 80 or there are two or more consecutive years with lamb recruitment below 35% at the time of survey in October/November. The MBL for this hunt area is 10. In 2015, 1 mountain lion was reported killed in this MBL area (1 female).

**Region 2**

Hunters harvested 62 mountain lions in Region 2 in 2015 which was higher than the 3-year average of 52. Hunters harvested 32 females in 2015 which was also higher than the 3-year average of 28. The multiple bag limit season in 13BS was removed as of July 1, 2015.

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Mountain lions harvested by hunters in Region 2 during 2015.

Unit	MBL	Total # Lions Harvested	Male	Female
5A		1	0	1
5B		7	2	5
6A		6	3	3
6B		1	1	0
7		3	2	1
8		7	4	3
9		7	4	3
12A		20	9	11
12B		0	0	0
13A		2	1	1
13B	10	8	4	4

Based on wildlife manager's observations of mountain lion sign throughout the year, mountain lions appear to be well distributed throughout the Region. Mountain lion density varies with the abundance of prey. Based on available prey and rough terrain, Units 6A, 6B, 8, and 12A have the best mountain lion habitat in Region 2.

**Region 3**

All units in Region 3 are open for mountain lion hunting. Wildlife managers continue to check harvested lions throughout the region during most months of the year. Hunters harvested 50 lions in 2015 which is higher than the 5-year average for the region (43). Twenty-four percent of the females were over the age of 3 years old. Sixty-four percent of the lion harvest occurred in the spring. There are 3 multiple bag areas in the region: Units 15BW/15C/15D, Unit 16AN, Units 16AS/18BS.

Mountain lions harvested by hunters in Region 3 during 2015.

Unit	MBL	Total # Lions Harvested	Male	Female
10		2	1	1
15A		1	1	0
15BE		0	0	0
15BW	10	0	0	0
15C	10	0	0	0
15D	10	0	0	0
16A		3	3	0
16AN	15	1	0	1
16AS	15	1	1	0
17A		5	2	3
17B		13	10	3
18A		7	4	3

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18B		4	2	2
18BS	15	1	0	1
19A		5	2	3
19B		6	3	3
20A		1	0	1

Units 15BW, 15C, and 15D have a multiple bag limit of 10 lions. There were no lions harvested in 2015 in that MBL area. The Region implemented the multiple bag limit to benefit the depressed bighorn sheep population in the Black Mountains. This area is not frequently hunted for lions due to extremely challenging topography and dry tracking conditions. Triggers for discontinuing this multiple bag season structure are based on the following numbers for Unit 15C South: a) the number of sheep observed per hour of survey time reaches the long-term average of 18.67 sheep per hour; b) the observed sheep population exceeds 108, and c) 10 lions are removed through any combination of methods in a single year. Region 3 has begun a predator research project that will further the knowledge of mountain lions in this area.

As part of the Unit 16A Predation Management Plan a contract houndsman was hired from December 1, 2015 - November 30, 2016. The contract houndsman removed 1 mountain lion (female) in December. Also, a new MBL for Unit 16A North was added in the fall of 2015 to assist a depressed mule deer population. Funds are being expended as part of the Wildlife Habitat Enhancement Initiative (WHEI) to increase the amount of open habitat through burning and thinning projects and to increase the reliable water distribution throughout the unit for mule deer. The region is pursuing avenues to increase predator removal efforts. As part of this effort the region believes that a multiple bag limit for this area would decrease the number of mountain lions in Unit 16A North and enhance the ability of the habitat improvement efforts in assisting the mule deer population to recover. The region recommends the MBL be placed at 15 lions for 2015-2016 and be re-evaluated next year based on harvest. The triggers for this MBL include; a) an increase in fawn:doe ratio to at least 40, b) an increase buck:doe ratio at or above guidelines (20-30) and c) an increase in deer seen per hour to 16 deer/hour. The fawn to doe ratio this year was 54:100, with a three year average of 32:100. The buck:doe ratio for this year was 44:100. The deer seen per hour is up to 11.9 from 7.6 the last year.

The Region implemented a multiple bag hunt structure in 2006-2007 in Unit 16A South and 18B South to benefit a translocated bighorn sheep population. The Department released 55 bighorn sheep into Unit 18B South and most have remained. Several sheep have traveled across U.S. Highway 93 into Unit 16A South where there is also a lion population. We documented 6 mortalities out of 20 collared sheep. We could only attribute 1 positively to lion predation. In December 2011, we released 20 sheep into Unit 16A South near People's Canyon. Two of the 9 collared sheep remained within close proximity to the release location. The other sheep spread to Unit 18B South and Unit 44A; some coming back to Unit 16A South. Of the 9 collared sheep, 6 have died, with 4 attributed to mountain lion predation. We transplanted 40 bighorn sheep into People's Canyon in November 2013; we have attributed several mortalities to lion predation. Hunters harvested 2 male lions in Unit 18B South during 2014. Triggers for discontinuing the

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multiple bag limit include; a) the bighorn sheep herd reaches a self-sustaining level, and b) less than 10% of the bighorn mortalities can be attributed to mountain lion predation.

The Region 3 office continues to respond to nuisance lion reports in various locations. Reports of mountain lions adjacent to housing developments are common due to increased housing density near National Forest lands. We removed no nuisance lions in 2015.

**Region 4**

For the past four years Region 4 has managed mountain lions under a liberal hunt structure in Game Management Units 39, 40A, 40B, 41, 42, 43A 43B, 44A and 44B. The annual bag limit is 3 mountain lions, with daylong shooting hours. Units 16B and 20C are managed under the standard season structure, with an annual bag limit of 1 mountain lion, and daylight-only shooting hours. Game Management Units 45A, 45B, 45C, 46A and 46B are entirely contained within National Wildlife Refuge boundaries and are currently closed to lion hunting. Region 4 has no units with a multiple bag limit hunt structure.

In 2015, eight lions were taken by sport harvest in Region 4 (4 males, 4 females). The liberal hunt structure in place throughout much of the region has apparently had no impact on harvest levels of lions. An average of eight lions have been taken in the four years that the current hunt structure has been in place (including Unit 20C). Prior to that, the average take was also eight lions per year. A number of these units had multiple bag limit seasons in place, prior to the current hunt structure, and the multiple bag was never met. The bulk of lion harvest in Region 4 normally comes from Unit 20C, which is managed under the standard hunt structure. Mountain lions are generally found at very low densities throughout most of the region, and because of the arid nature and unfavorable vegetative types, pursuit with dogs is relatively ineffective.

Mountain lions harvested by hunters in Region 4 during 2015.

Unit	Bag Limit	Total # Lions Harvested	Male	Female
16B	1	0	0	0
20C	1	3	2	1
39	3	1	1	0
40A	3	0	0	0
40B	3	0	0	0
41	3	0	0	0
42	3	2	0	2
43A	3	0	0	0
43B	3	0	0	0
44A	3	2	1	1
44B	3	0	0	0

Because of concerns about lion predation on bighorn sheep and the impacts that predation has on suppressing translocated and important source populations, adaptive predation management plans

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are being implemented in two areas in Region 4. These areas are the Kofa Mountains Complex, centered on the Kofa National Wildlife Refuge (Unit 45 and portions of Units 41 and 44BS), and the North Sector of Region 4, which includes Units 20C, 42, 44A, and 44BN. Currently, 25 lions that spent at least a portion of their time within the Kofa Complex have been captured and radio-collared, and 17 have been captured and radio-collared in the North Sector. Under the adaptive management plans, lions that are determined to be preying on bighorn sheep at a level specified in the respective adaptive management plan, may be removed if they reach “offending” status. During this reporting period, a single lion in Unit 44A, a male, was removed as a nuisance animal under the guidelines of the Units 20C, 42, 44A and 44B Adaptive Lion Management Plan. Five lions, four females and one male, were removed from Unit 45 under the guidelines of the Kofa Mountains Complex Predation Management Plan. Lion removals are implemented by a State-funded employee.

**Region 5**

Hunters reported harvesting 117 lions (51 males, 65 female, 1 sex unknown) in Region 5 in 2015. This number is consistent with historical harvests in the region with a 3-year average of 99. In 2015, Region 5 represented 36.1% of the state's lion harvest. The Commission approved discontinuation of the multiple bag areas of Units 31 and 32 beginning July 1, 2014. Multiple bag limits in Units 28S and 37BN were not met.

Mountain lions harvested by hunters in Region 5 during 2015.

Unit	MBL	Total # Lions			
		Harvested	Male	Female	Unknown
28		1	0	1	0
28S	8	1	0	1	0
29		4	2	2	0
30A		8	3	5	0
30B		3	1	2	0
31		6	4	2	0
32		11	6	5	0
33		21	8	12	1
34A		10	4	6	0
34B		4	3	1	0
35A		8	3	5	0
35B		8	4	4	0
36A		6	5	1	0
36B		7	2	5	0
36C		8	3	5	0
37A		0	0	0	0
37B		11	3	8	0
37BN	4	0	0	0	0
38M		0	0	0	0

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**Region 6**

All units within Region 6, including portions of the metro units, are open to mountain lion hunting. During 2015, hunters harvested 48 mountain lions (30 males, 17 females, 1 sex unknown) and 2 mountain lions road kills were reported. No mountain lions were recorded harvested within the multiple bag limit area of Unit 37B but Unit 21 had a recorded harvest of 7 mountain lions during its first year of having a multiple bag limit.

Mountain lions hunter harvested in Region 6 during 2015.

Unit	MBL	Total # Lions		
		Harvested	Male	Female
20B		3	3	0
21	12	7	2	4
22		10	7	3
23		18	11	7
24A		9	6	3
24B		1	1	0
25M		0	0	0
26M		0	0	0
37BN	4	0	0	0

The Region continues to respond to nuisance mountain lion observations, reports, and conflicts, primarily within the urban-wildland interface.

Region 6 discontinued the multiple bag limit in Unit 37B North (effective July 1, 2016) as the management objective/triggers were met:

- A viable population of desert bighorn sheep has been established in suitable, but mostly occupied, bighorn habitat in the Mineral Mountains, or
- After a period of 5 years and the determination has been made that the continued use of a multiple bag limit is not beneficial or necessary for the establishment of a viable sheep population.
- The multiple bag limit structure may be reinstated if bighorn population levels decline to or below 30 individuals.

In April 2015, Region 6 recommended that a multiple bag limit for mountain lion be approved for Unit 21. The Predation Management Plan and Management Focus Area plan for Unit 21 outline the need to implement this strategy as fawn recruitment rates for both pronghorn and deer have been below guidelines in recent years and perceived to be caused by coyote and mountain lion predation. The landscape scale habitat projects as part of the Wildlife Habitat Enhancement Initiative approved for Unit 21, primarily for mule deer, also outlines the use of predator management during the project timelines.

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The multiple bag limit structure for Unit 21 may be discontinued when specific objectives set to evaluate the effectiveness of the strategies and actions outlined in the Predation Management Plan indicate:

- Increased pronghorn fawn to doe ratio to >50:100 for the last two years of the project.
- Increased pronghorn population to 350 adults.
- Increased mule deer population in the semi-desert grassland habitat types to meet management objectives identified in hunt guidelines, Management Focus Area and Department plans, goals and objectives.
- Reduced coyote and mountain lion populations in the grassland areas.