

**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 gender harvest data to assure that populations remain at sustainable levels.
  - Sportsmen harvested 233 mountain lions in 2014, compared to 302 in 2013. An additional 33 lions were reported harvested under the depredation statute (ARS 17-302) and 2 reported as other kill (road kill or nuisance kill).
  - From 2010-2014 Arizona hunters have harvested an average of 260 mountain lions annually, with a range of 233–302.
  - In 2014, female mountain lions represented 51% ( $n = 119$ ) of the total hunter harvest ( $n = 233$ ).
2. Provide recreational opportunity for 6,000 or more hunters per year.
  - In 2014, the Department provided mountain lion recreational opportunity to 11,124 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.
  - Lions are apparently expanding their range in Arizona. 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. Conduct a hunter and hounds-man questionnaire every two years (1.A.1–1.A.6).
  - We no longer conduct these surveys.
6. 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.
7. 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.
8. 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).

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- 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 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 2014-2015. The multiple bag limit was not reached in any hunts.
9. 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.
10. 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.

**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. When using interstate highways as management polygons for harvest analysis, the adult female portion of Arizona’s mountain lions is not being influenced by hunting.

Annual mountain lion tag sales and harvest information, 1977–2014.

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
1988	8396	99	184	24	1	209
1989	3603	67	130	65	1	196

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Year	Tags Sold		Harvest			Total
	Resident	Non-Resident	Hunter <sup>1</sup>	Depredation	Other	
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

<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, 2014 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	5	0	0	5	2	3	0	2	1	0	2
02A	1	0	0	0	0	1	1	0	0	0	1
03C	1	0	0	0	1	0	0	0	0	1	0
04A	1	0	0	1	0	1	0	0	0	0	1
05A	1	0	0	1	1	0	0	0	1	0	0
05B	4	0	0	2	2	2	0	2	0	1	1
06A	8	0	0	6	4	4	1	3	1	2	2
7	1	0	0	1	1	0	0	1	0	0	0
8	5	0	0	4	2	3	0	3	1	1	0
9	1	0	0	1	1	0	0	0	0	0	1
10	8	1	0	4	3	5	1	4	1	1	2
12A	16	0	0	15	6	10	4	5	2	0	9
12B	2	0	0	2	2	0	0	0	0	0	2
13A	1	0	0	1	1	0	0	0	0	0	1
13B	2	0	0	1	1	1	0	0	0	1	1
15A	1	0	0	0	0	1	1	0	0	0	1
15B	1	0	0	0	0	1	0	0	1	0	0
16A	1	0	0	1	1	0	0	0	0	0	1
17A	3	0	0	1	1	2	2	1	1	0	1
17B	5	0	0	5	3	2	1	2	0	0	3
18A	4	1	0	2	1	3	1	2	1	0	1
18B	3	2	0	3	1	2	2	1	1	0	1

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18BS	2	0	0	2	1	1	0	1	0	0	1
19A	5	0	0	4	3	2	0	3	2	0	0
19B	1	0	0	1	1	0	0	1	0	0	0
20A	5	0	0	5	3	2	1	2	2	0	1
20B	1	0	1	1	0	1	1	0	1	0	0
20C	2	0	0	2	2	0	0	0	0	1	1
21	6	0	0	1	2	4	0	1	1	0	4
22	3	0	0	2	2	1	1	3	0	0	0
23	7	0	0	4	4	3	0	2	1	1	3
24A	8	0	0	4	5	3	2	2	2	2	2
24B	2	1	0	1	2	0	0	0	1	0	1
27	13	2	0	10	5	8	4	6	0	1	6
27L	2	0	0	2	1	1	0	2	0	0	0
27U	5	0	0	4	2	3	1	0	1	3	1
28	3	6	0	3	1	2	1	1	1	0	1
28L	2	0	0	0	0	2	0	1	0	1	0
29	4	0	0	2	1	3	1	0	1	1	2
30A	4	0	0	4	2	2	1	3	0	0	1
30B	6	0	0	2	3	3	1	3	0	2	1
31	3	8	0	2	2	1	1	2	1	0	0
31AG	1	0	0	1	1	0	0	1	0	0	0
32	9	9	0	7	7	2	1	1	0	1	7
32AG	8	0	0	6	5	3	2	5	3	0	0
33	13	1	1	7	8	5	1	6	2	1	4
34A	7	1	0	7	4	3	1	4	1	1	1
34B	4	0	0	4	2	2	0	3	0	0	1
35A	3	0	0	3	1	2	2	1	1	0	1
35B	2	0	0	2	0	2	0	0	0	1	1
36A	9	1	0	7	5	3	2	2	3	1	3
36B	7	0	0	4	2	4	1	1	2	0	4
36C	1	0	0	0	0	1	0	1	0	0	0

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37A	1	0	0	0	0	1	0	1	0	0	0
37B	5	0	0	4	1	4	2	2	2	0	1
39	1	0	0	0	0	1	0	0	1	0	0
41	1	0	0	0	0	1	0	1	0	0	0
42	1	0	0	0	0	1	1	0	0	1	0
44A	1	0	0	0	0	1	0	0	0	0	1
<b>Total</b>	<b>233</b>	<b>33</b>	<b>2</b>	<b>164</b>	<b>112</b>	<b>119</b>	<b>42</b>	<b>88</b>	<b>40</b>	<b>25</b>	<b>80</b>
Percent	87	12	1	70	48	52		38	17	11	34

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**REGIONAL SUMMARY**

**Region 1**

Hunters harvested 28 mountain lions in Region 1 in 2014.

Mountain lions harvested by hunters in Region 1 during 2014.

Unit	MBL	Total # Lions Harvested	Male	Female
1		5	2	3
2A		1	0	1
2B		0	0	0
2C		0	0	0
3A		0	0	0
3B		0	0	0
3C		1	1	0
4A		1	0	1
4B		0	0	0
27		13	5	8
27L	10	2	1	1
27U	8	5	2	3

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 2014, 5 lions were harvested from the Upper Blue River multiple bag limit area in Unit 27 (2 males, 3 females).

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 2014, 2 mountain lions were reported killed in this MBL area (1 male, 1 female).

**Region 2**

Hunters harvested 41 mountain lions in Region 2 in 2014 which was higher than the 3-year average of 52. Hunters harvested 20 females in 2014 which was lower than the 3-year average of 25.

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Mountain lions harvested by hunters in Region 2 during 2014.

Unit	MBL	Total # Lions Harvested	Male	Female
5A		1	1	0
5B		4	2	2
6A		8	4	4
6B		0	0	0
7		1	1	0
8		5	2	3
9		1	1	0
12A		7	3	4
12AE		3	2	1
12AW		6	1	5
12B		2	2	0
13A		1	1	0
13BS	10	0	0	0
13BW		2	1	1

For 2014, 13BS had a multiple bag limit of 10 with daylong shooting hours. No lions were harvested in Unit 13BS in 2014. Hunters harvested 1 lion in Unit 13BS in 2013 and 2011 and no lions were harvested in 2012. The multiple bag limit and yearlong season in 13BS does not appear to be increasing lion harvest.

The MBL in Unit 13BS will continue until the following triggers are met: (1) a 5-year average of bighorn sheep lamb:ewe ratio above 22:100), (2) an increase in the average number of class III and IV rams available for harvest within the population equal to 2 or more permits on the permit worksheet, and (3) no harvest of lions as a result of bighorn sheep depredation.

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 38 lions in 2014; which is about average for the region. Twenty-one were females with an age range of 1 – 8 yrs. Sixty-eight percent of the lion harvest occurred in the spring. There remain 2 multiple bag areas in the region: Units 15BW, 15C, and 15D and Units 16AS and 18BS.

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Mountain lions harvested by hunters in Region 3 during 2014.

Unit	MBL	Total # Lions Harvested	Male	Female
10		7	2	5
15A		1	0	1
15BE		1	0	1
15BW	10	0	0	0
15C		0	0	0
15D		0	0	0
16A		1	1	0
16AS	15	0	0	0
17A		3	1	2
17B		5	3	2
18A		4	1	3
18B		3	1	2
18BS	15	2	1	1
19A		5	3	2
19B		1	1	0
20A		5	3	2

Units 15BW, 15C, and 15D have a multiple bag limit of 10 lions. There were no lions harvested in 2014 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 15CS: 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.

The Region implemented a multiple bag hunt structure in 2006-2007 in Unit 16AS and 18BS to benefit a translocated bighorn sheep population. The Department released 55 bighorn sheep into Unit 18BS and most have remained. Several sheep have traveled across U.S. Highway 93 into Unit 16AS 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 16AS near People's Canyon. Two of the 9 collared sheep remained within close proximity to the release location. The other sheep spread to Unit 18BS and Unit 44A; some coming back to Unit 16AS. 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 18BS during 2014. Triggers for discontinuing the multiple bag limit are: a) the bighorn sheep herd reaches a

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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 2014. One roadkill lion was recovered on Interstate-40 east of Ashfork (mm 154).

**Region 4**

For the past 2 years Region 4 managed mountain lions under a “liberal hunt structure” in most units. The annual bag limit is three mountain lions, with daylong shooting hours in units 39, 40A, 40B, 41, 42, 43A 43B, 44A and 44B. We manage Units 16B and 20C under a "standard season structure". The annual bag limit is one mountain lion, with daylight-only shooting hours. Units 45A, 45B, 45C, 46A and 46B are entirely contained within National Wildlife Refuge boundaries and are closed to lion hunting. Region 4 has no units with a multiple bag limit hunt structure.

In 2014, hunters reported taking 4 lions in the Region; 2 in Unit 20C, 1 in Unit 39, and 1 in Unit 41. The liberal hunt structure in place throughout much of the Region has had minimal impact on harvest of lions. 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 aridity and unfavorable habitats, pursuit with dogs is relatively ineffective.

Mountain lions harvested by hunters in Region 4 during 2014.

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

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the North Sector, which includes Units 20C, 42, 44A, and 44B. Currently, 21 lions have been captured and radio-collared in the Kofa Complex, and 14 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 may be removed if they reach “offending” status. In 2014, two nuisance lions were removed: 1 in Unit 42 and 1 in Unit 44A.

**Region 5**

Hunters reported harvesting 92 lions (45 male, 45 female, 2 sex unknown) in Region 5 in 2014. This number is consistent with historical harvests in the region with a 3-year average of 95. In 2014, Region 5 represented 39.5% of the state's lion harvest. Hunters harvested 9 lions in the multiple bag limit areas of Units 31 and 32 (Aravaipa-Galiuro). The Commission approved discontinuation of the multiple bag areas of Units 31 and 32 beginning July 1, 2014.

Mountain lions harvested by hunters in Region 5 during 2014.

Unit	MBL	Total # Lions			
		Harvested	Male	Female	Unknown
28		3	1	2	0
28S	8	2	0	2	0
29		4	1	3	0
30A		4	2	2	0
30B		6	3	3	0
31		3	2	1	0
31AG	20	1	1	0	0
32		8	6	2	0
32AG	20	8	5	3	0
33		14	9	5	0
34A		7	4	3	0
34B		4	2	2	0
35A		3	1	2	0
35B		2	0	2	0
36A		9	5	3	1
36B		7	2	4	1
36C		1	0	1	0
37A		1	0	1	0
37B		5	1	4	0
38M		0	0	0	0

**Region 6**

All units within Region 6, including portions of the Metro units, are open to mountain lion hunting. During 2014, hunters harvested 27 mountain lions (15 males, 12 females), 1 reported road kill, and 1 depredation. No mountain lions were harvested in Unit 22 within the multiple bag limit area in the southern part of the unit; or in Unit 37B North, which is also in the multiple bag limit structure.

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Mountain lions harvested by hunters in Region 6 during 2014.

Unit	MBL	Total # Lions		
		Harvested	Male	Female
20B		1	0	1
21		6	2	4
22		3	2	1
22S	12	0	0	0
23		7	4	3
24A		8	4	4
24B		2	2	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 22 South (effective July 1, 2015) as both triggers were met:

- Annual helicopter survey efforts detect > 70 desert bighorn (2009, 99 total sheep observed; 2012, 176 total sheep observed)
- Annual helicopter surveys indicate a lamb: 100 ewes ratio of > 26 for two successive survey years, (2009, 33 lambs: 100 ewes; 2012, 36 lambs: 100 ewes)

Even though these triggers were met previously, Unit 22 South continued to have a multiple bag limit while it was used as a source population for bighorn sheep translocations. However, current data and the limited to no use of the multiple bag limit, resulted in the Commission removing Unit 22 South from multiple bag limit designation.

In April 2011, the Arizona Desert Bighorn Sheep Society petitioned the Game and Fish Commission to implement a 4 lion multiple bag limit in Unit 37B (north of the Gila River) to aid in the establishment of a bighorn sheep population in the Mineral Mountains. Three, possibly four, radio-collared bighorn mortalities were attributed to mountain lion predation within the last 3 years. The Commission approved this multiple bag limit starting July 1, 2011.

The multiple bag limit structure for Unit 37B North may be discontinued when:

- 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.

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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.

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.