

**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.
  - 230 mountain lions were harvested by sportsmen in 2012, as compared to 285 in 2011. An additional 37 lions were reported harvested under the depredation statute (ARS 17-302) and 4 reported as other kills (road kill or nuisance kill).
  - Arizona's past 5-year (2007-2011) average hunter harvest of mountain lions is 260, with a range of 247–288.
  - In 2012, female mountain lions represented 45% ( $n = 104$ ) of the total hunter harvest ( $n = 229$ ).
2. Provide recreational opportunity for 6,000 or more hunters per year.
  - In 2012, recreational opportunity was provided to 10,941 hunters. Many individuals that purchase lion tags are purchasing them on the remote chance they will encounter a mountain lion during other hunts. Incidental harvest represents a small percentage of annual mountain lion hunter 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 and depredation kills and the results of increasing research effort and incidental survey efforts support the accomplishment of this objective. Lions are apparently expanding their range in Arizona, with increasing documentation of them in what was thought to be unoccupied or sparsely occupied habitats.
4. Maintain a complete database from all harvest sources, through a mandatory checkout system, including age, sex, and harvest location to index population trends.
  - A complete database for harvested lions from 1981 to the present is maintained. 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).
  - These surveys are no longer conducted.
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. Some areas may need to be managed at 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.

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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).
  - 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.
  - Twelve multiple bag limit mountain lions hunts were offered in 2011-2012. The multiple bag limit was reached in 1 hunt occurring in Units 31 and 32 (data has not been summarized for 2012-2013 seasons).
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 are probably reflective of the population growth, stability, or decline of mountain lions in Arizona when compared to hunter effort and tag purchases. Mountain lion population trends tend to follow prey population trends and take about 2 generations (4 years) to react to changes in prey numbers. Based on all biological evidence as measured by 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 prey population objectives are being met. 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, 1977–2012.

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

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Year	Tags Sold		Harvest			Total
	Resident	Non-Resident	Hunter <sup>1</sup>	Depredation	Other	
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
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	230	37	4	271

<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, 2012 calendar year.

Unit	Harvest			Harv. Using Dogs	Hunter Harv.		Adult Females >= 3 yrs	Month of Hunter Harvest			
	Hunter	Depredation	Other		Male	Female		Jan. to March	Apr. to June	July to Sept.	Oct. to Dec.
01	5	0	0	3	5	0		1	0	1	3
03B	0	0	1	-	-	-		-	-	-	-
03C	6	0	0	5	2	4		1	0	0	5
04B	4	0	0	3	2	2		1	0	1	2
05A	1	0	0	0	0	1		1	0	0	0
05B	7	0	0	5	5	2		5	0	1	1
06A	5	0	0	4	2	3		1	0	1	3
06AS	5	0	0	4	2	3		5	0	0	0
07	3	0	0	2	2	1		2	0	0	1
08	4	0	1	2	2	2		1	0	0	3
09	7	0	0	6	5	2		4	0	0	3
10	11	0	0	7	7	4		6	1	2	2
11M	1	0	0	1	1	0		0	0	0	1
12A	3	0	0	3	1	2		0	0	0	3
13A	1	0	0	1	1	0		0	0	0	1
15D	0	0	1	-	-	-		-	-	-	-
16A	1	0	0	1	0	1		1	0	0	0
16AS	2	0	0	1	0	2		1	0	0	1
17A	3	0	0	1	1	2		2	0	0	1
17B	5	0	0	5	2	3		4	0	0	1
18A	2	0	0	0	2	0		1	0	0	1
18BS	1	0	0	1	1	0		1	0	0	0
19A	1	0	0	0	1	0		1	0	0	0
19B	1	0	0	0	0	1		0	0	0	1
20A	4	0	0	3	1	3		3	0	1	0
20B	3	0	0	2	2	1		1	0	0	2
20C	5	0	0	3	1	3		3	1	0	1
21	9	0	0	5	4	5		6	0	1	2
22	7	0	0	5	5	2		2	2	0	3
22S	3	0	0	1	1	2		1	0	1	1
23	18	0	0	14	12	6		7	4	4	3

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	Hunter	Depredation	Other		Male	Female		Jan. to March	Apr. to June	July to Sept.	Oct. to Dec.
24A	4	0	0	1	1	3		1	0	0	3
24B	2	0	0	1	1	1		1	0	0	1
27	13	6	0	9	6	7		3	1	2	6
28	3	9	0	3	1	2		0	1	0	2
29	2	0	0	2	1	1		2	0	0	0
30A	4	0	0	3	3	1		1	0	0	3
30B	3	0	0	0	2	1		0	0	0	3
31	4	13	0	4	2	2		4	0	0	0
32	10	9	1	5	5	5		3	0	3	3
33	22	0	0	15	13	9		11	2	1	8
34A	5	0	0	4	3	2		0	1	1	3
34B	3	0	0	3	2	1		0	1	1	1
35A	7	0	0	4	2	5		4	0	1	1
35B	2	0	0	2	2	0		1	0	0	1
36A	3	0	0	1	0	3		1	1	0	1
36C	4	0	0	2	4	0		3	0	0	1
37A	1	0	0	0	0	1		0	1	0	0
37B	3	0	0	1	3	0		0	0	0	3
37BN	1	0	0	0	1	0		0	1	0	0
39	2	0	0	0	1	1		1	0	0	1
42	2	0	0	1	1	1		2	0	0	0
44A	1	0	0	1	1	0		0	1	0	0
44AE	1	0	0	1	0	1		1	0	0	0
<b>TOTAL</b>	<b>230</b>	<b>37</b>	<b>4</b>	<b>151</b>	<b>125</b>	<b>104</b>		<b>101</b>	<b>18</b>	<b>22</b>	<b>86</b>
Percent	85	14	1	66	55	45		44	8	10	37

**REGIONAL SUMMARY**

**Region 1**

Fifteen mountain lions were harvested in Region 1 from July 2012 to June 2013.

<u>Unit</u>	<u>No. Mtn. Lions</u>
1	5 (5♂, 0♀)
3B	0
3C	6 (2♂, 4♀)
4A	0
4B	4 (2♂, 2♀)
27	13 (6♂, 7♀)

The region has had 2 hunt areas with multiple bag limits, Pipestem (27P) and Bear Canyon (27BC) in Unit 27. Both were established to increase translocated Rocky Mountain bighorn sheep populations with the following site-specific objectives:

Bear Canyon – initiate and/or continue the multiple bag hunt as long as the estimated sheep population is below 40 or there are 2 or more consecutive years with lamb recruitment below 35%. This hunt will cease when the estimated sheep population is above 40 and 1 of the last 2 years of survey data indicates lamb recruitment is above 35%. The Bear Canyon bighorn sheep population has experienced severe losses due to lion predation in the past. Surveys in November 2011 found 16 sheep with an estimated population of 27, but no lambs were observed. The region has a sustainable population goal of 40 sheep for this herd.

The Bear Canyon multiple-bag unit will have boundary changes and name change for 2013, reflecting the bighorn sheep hunt unit boundary changes, and the Bear Canyon and Foote Creek bighorn hunt areas will become the Upper Blue River hunt area. The multiple bag limit area will have the same name.

In Pipestem (renamed in 2012 to Lower Blue Hunt Area to correspond with the bighorn sheep unit naming and description), we will initiate and/or continue the multiple bag hunt as long as the estimated sheep population is below 60 or there are 2 or more consecutive years with lamb recruitment below 35%. This hunt will cease when the estimated sheep population is above 60 and 1 of the last 2 years of survey data indicates lamb recruitment is above 35%. The Pipestem area received a release of bighorn sheep in August 2005. Predation control measures may be needed to allow this sheep population to reach a sustainable population and help ensure the future success of this transplanted population. This population has a target of 60 sheep to be considered sustainable. Surveys in October 2008 found 21 sheep, so it was recommended to continue the multiple bag limit structure. Surveys were completed in October 2010 and October 2012, but no sheep were found within the core Pipestem area. The San Francisco River drainage, which was added when the description was changed, has also seen very low lamb recruitment.

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**Region 2**

Thirty-seven mountain lions were harvested in Region 2 in 2012, which was 20% lower than the previous 3-year average of 46. Sixteen females were harvested in 2012, which is 24% lower than the 3-year average of 21.

For 2012-2013, 13B South had a multiple bag limit with a yearlong season date. Those without multiple bag limits also had a yearlong season. No lions were harvested in Unit 13B in 2012. One lion was harvested in 13B in 2011, and this is the only lion harvested in the unit the last 3 years.

The Unit 13B South hunt will be continued until the following triggers are met: a 5-year average lamb:ewe ratio above 22:100, 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 no harvest of lions.

Based on wildlife manager observations of 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. There were 32 lions hunter harvested in 2012 (including 1 lion found to be involved in a vehicle collision), a drop from 50 lions last year. Half of these lions were females; however none were older than 3 years of age. Sixty-five 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.

Units 15BW, 15C, and 15D have multiple bag limit of 10 lions. There were no lions harvested in 2012, however a road kill male was found on AZ Highway 68 in the spring. The multiple bag limit was implemented to benefit the depressed population of bighorn sheep 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.

A multiple bag hunt structure was implemented in 2006-2007 in Unit 16AS and 18BS to benefit a translocated population of bighorn sheep. Fifty-five bighorn sheep were released into Unit 18BS and most have remained there. Several sheep have traveled across U.S. Highway 93 into Unit 16AS where there is also a lion population. There were 6 documented mortalities out of 20 collared sheep, but only 1 could positively be attributed to lion predation. In December 2011, 20 sheep were release 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 both Unit 18BS and Unit 44A; some coming back to Unit 16AS. Of the 9 collared sheep, 6 have died, with 4 attributed to

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mountain lion predation. In 2012, 2 female lions were removed from Unit 16AS and 1 male from Unit 18BS. Triggers for discontinuing the multiple bag limit are: 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. No nuisance lions were removed in 2012.

#### **Region 4**

Before 2012, the Region had 3 lion hunt areas with multiple bag limits. Due to the institution of new "liberal hunt structures" in most of the units in Region 4, we elected to discontinue the multiple bag structures that were in place in units 40A, 42, and 44A. Units 39, 40A, 40B, 41, 42, 43A, 43B, 44A, and 44B now have the liberal hunt structure with a 3 lion bag limit and day-long hunt times. Unit 20C will remain part of the Standard Lion Management Zone with a "standard season structure".

Units 45A, 45B, 45C, 46A, and 46B are national wildlife refuges and are closed to lion hunting. The remainder of the Region is open. In 2012, 11 lions were reported taken by sport hunters in the Region: 5 in Unit 20C, 2 in Unit 39, 2 in Unit 42, and 2 in Unit 44A.

Because of concerns about lion predation on bighorn sheep, 2 areas in the region now have Adaptive Predation Management Plans in place. These areas are the Kofa Mountains Complex, centered on the Kofa National Wildlife Refuge, and the North Sector which includes Units 20C, 42, 44A, and 44B. Eighteen lions have been captured and radio-collared under the Kofa plan and so far 8 lions have been collared in the North Sector.

#### **Region 5**

Hunter harvest of 77 lions (44 male, 33 female) were reported in Region 5 in 2012. Harvest in Region 5 has been higher in recent years but declined this year and is consistent with historical harvests in the region. In 2012, Region 5 represented 33.5% of the state's lion harvest. Thirty-one additional lions were taken in the region under the depredation law which is the same as last year.

#### **Region 6**

All units within Region 6, including portions of Metro units, are open to mountain lion hunting. During 2012, 49 mountain lions were hunter harvested (29 males, 20 females), with no recorded take by depredation or other means. Whereas in 2011, 50 (29 males and 21 females) mountain lions were hunter harvested, 1 depredation take, and 1 by other means. Three lions recorded harvested in Unit 22 were within the multiple bag limit area in the southern part of the unit; 3 lions were taken in Unit 37B which is also in the multiple bag limit structure.

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

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Changes to Commission Rules and Orders in 2012 allowed daylong shooting hours for mountain lions in minimal occurrence population zones. The Region's first mountain lion (about 9 year-old female) harvest using spotlighting at night was in the multiple bag limit area of Unit 22S on January 7, 2012. In Unit 37BN, a hunter also reported harvesting a lion using spotlighting methods.

Triggers considered for discontinuing the multiple bag limit in Unit 22S were established in 2000. Region 6 may discontinue the multiple bag limit in Unit 22S if:

- Annual helicopter survey efforts detect > 70 desert bighorn (2009, 99 total sheep observed; and
- Annual helicopter surveys indicate a lamb: 100 ewes ratio of > 26 for two successive survey years, (2006, 36 lambs: 100 ewes and 2009, 33 lambs: 100 ewes)

Even though these triggers have been met, Unit 22S continues to have a multiple bag limit while it is used as a source population for bighorn sheep translocations.

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. Two, possibly 3, radio-collared bighorn mortalities were attributed to mountain lion predation within the last 2 years. The Commission approved this multiple bag limit starting July 1, 2011.

The multiple bag limit structure for Unit 37BN 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.