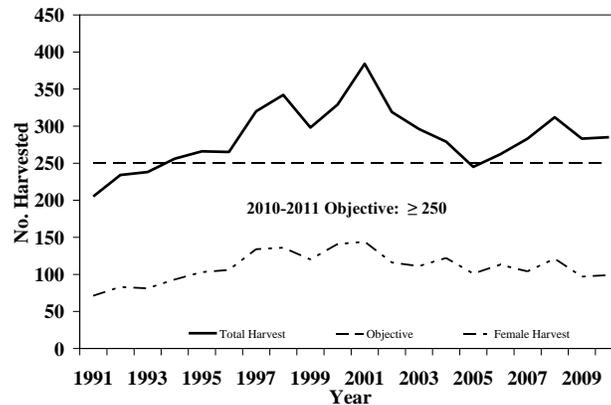


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Goal: Manage the mountain lion population, its numbers and distribution, as an important part of Arizona's fauna and to provide mountain lion hunting recreation opportunity while maintaining existing occupied habitat and the present range of mountain 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 (1.A.1–1.A.6, 1.B.1–1.B.3, 1.B.6–1.B.7).
  - 247 mountain lions were harvested by sportsmen in 2010, as compared to 249 in 2009. An additional 31 lions were reported harvested under the depredation statute (ARS 17-302) and 7 reported as other kills (road kill or nuisance kill).
  - Arizona's past 5-year average sport harvest of mountain lions is 246, with a range of 221–265.
  - In 2010, female mountain lions represented 40% ( $n = 99$ ) of the total hunter harvest ( $n = 247$ ).
2. Provide recreational opportunity for 6,000 or more hunters per year (1.B.1–1.B.3).
  - In 2010, recreational opportunity was provided to 10,265 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 very 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 (1.A.1–6).
  - 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 (1.A.1–1.A.6).
  - 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 houndsman questionnaire every two years (1.A.1–1.A.6).
  - These surveys are not being conducted at this time.

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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 radiomarked 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).
  - 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.
  - Ten multiple bag limit mountain lions hunts were offered in 2010-2011. No multiple bag limits were reached.
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 has continued 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. For example, a drought in 2001–2002 that decreases prey could be detected in mountain lion populations in 2005–2006.

Based on the totality of the biological evidence as measured by genetics and harvest trends, mountain lion populations in Arizona show an increasing trend. Arizona’s management strategy is to protect the adult female element of the mountain lion population in areas where prey population objectives are being met. Should female harvest comprise >35% of the harvest for a group of units that biologically may be combined as a zone, female harvest limits may be established to reduce the overall female harvest 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

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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, 1977–2010.

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
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

<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, 2010 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.
1	3	0	0	3	3	0	0	0	1	0	2
2A	1	0	0	0	0	1	0	0	0	0	1
3C	3	0	0	3	2	1	0	1	0	0	2
4B	1	0	0	0	0	1	0	0	0	0	1
5A	2	0	0	1	2	0	0	0	0	0	2
5B	2	0	0	2	1	1	1	1	0	0	1
6A	4	0	0	3	3	1	0	3	0	0	1
6A South	7	0	0	4	4	3	0	3	0	1	3
7	7	0	0	6	5	2	1	5	1	0	1
8	2	0	0	2	1	1	0	0	0	0	2
9	2	0	0	2	1	1	1	0	0	0	2
10	7	0	0	3	3	4	3	3	1	0	3
12A	9	0	0	4	3	6	3	0	0	2	7
13A	3	0	0	3	1	2	0	0	0	0	3
15A	1	0	0	0	0	1	0	0	0	0	1
15B West	1	0	0	1	1	0	0	1	0	0	0
15D	1	0	0	1	0	1	1	1	0	0	0
16A	5	1	0	5	4	1	0	4	0	0	1
16A South	1	0	0	0	0	1	1	0	0	1	0
17A	3	0	0	2	1	2	0	2	0	0	1
17B	13	0	0	12	6	7	0	5	2	0	6
18A	1	0	1	1	1	0	0	0	1	0	0
18B	2	1	0	2	2	0	0	0	1	0	1
18B South	2	0	0	0	1	1	1	1	0	0	1
19A	5	0	0	5	3	2	1	3	2	0	0
19B	5	0	0	2	4	1	0	1	0	0	4
20A	8	0	0	5	5	3	2	5	2	1	0
20B	3	1	0	2	1	2	1	2	0	0	1
20C	7	0	2	5	5	2	0	2	1	2	2

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Mountain lion information from mandatory checkout and stock killing reports, 2010 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.
21	3	0	1	3	2	1	0	2	0	0	1
22	6	0	0	6	5	1	0	3	0	0	3
22 South	3	0	0	2	2	1	1	1	0	1	1
23	13	0	0	12	10	3	2	5	1	2	5
24A	5	0	0	3	5	0	0	3	1	0	1
27	6	1	0	5	4	1	0	2	0	0	4
27 Pipestem	1	0	0	0	0	1	0	0	0	0	1
28	5	8	1	3	2	3	0	0	3	0	0
29	5	0	0	3	4	1	0	0	0	0	5
30A	3	0	0	2	2	1	0	2	0	0	1
30B	2	0	1	0	1	1	0	1	1	0	0
31	3	7	0	1	1	2	2	1	0	0	2
32	12	11	1	5	8	4	1	2	1	0	9
33	20	0	0	15	14	6	3	10	4	2	4
34A	8	0	0	5	3	5	2	3	0	2	3
34B	6	0	0	5	4	2	0	1	0	0	5
35A	10	1	0	4	5	5	3	5	1	1	3
35B	4	0	0	2	2	2	2	2	0	0	2
36A	4	0	0	2	4	0	0	1	0	1	2
36B	4	0	0	0	0	4	1	0	0	1	3
36C	3	0	0	2	2	1	1	1	1	0	1
37A	1	0	0	0	0	1	0	0	0	0	1
37B	5	0	0	4	2	3	0	2	0	1	2
38M	1	0	0	1	0	1	1	1	0	0	0
44A East	3	0	0	1	2	1	0	0	1	1	1
<b>Total</b>	<b>247</b>	<b>31</b>	<b>7</b>	<b>165</b>	<b>147</b>	<b>99</b>	<b>35</b>	<b>91</b>	<b>26</b>	<b>19</b>	<b>109</b>
Percent	87	11	2	67	60	40	14	37	11	8	44

## **REGIONAL SUMMARY**

### **Region 1**

Fifteen mountain lions were harvested in Region 1 from July 2010 to July 2011.

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

The region has 2 multiple bag limit units, Pipestem (27PS) and Bear Canyon (27BC) in Unit 27. Both were established to increase extant 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 October 2010 found 29 sheep with an estimated population of 48. The region has a sustainable population goal of 40 sheep for this herd and it has been recommended for removal from the multiple bag limit structure; however, the Commission elected to leave the structure in place.

Pipestem – 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 population target of 60 sheep to be considered sustainable. Surveys in October 2008 found 21 sheep in this area so it was recommended to continue the multiple bag limit structure in this area. Surveys were completed again in October 2010, but no sheep were found within the core Pipestem area.

### **Region 2**

Thirty-seven mountain lions were harvested in Region 2 in 2010, which was similar to the previous 3-year average of 39. There were 17 females harvested in 2010 compared to the 3-year average of 15.

For 2011-2012, the units with multiple bag limits (Units 6A South and 13B South) have yearlong season dates, while those without multiple bag limits have season dates of August 19 through

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May 24. Seven lions were harvested in Unit 6A in 2010, which was down slightly compared to the previous 3-year average of 9. No lions were harvested in Unit 13B in 2010, which was lower than the 3-year average of 2.

Currently, a multiple bag limit for lions is in effect in Unit 6AS. Region 2 will discontinue the multiple harvest objective if: (1) radioed bighorn sheep experience an annual mortality of <10% and the number of bighorn sheep observed on routing surveys exceed 55 animals, or (2) bighorn sheep are not being monitored through radio-telemetry, or (3) no lions are harvested within a 3-year period (lack of lion harvest may indicate a low population of lions).

For the Unit 13B South hunt to be discontinued, the following triggers apply: (1) a 5-year average 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) 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 out harvested lions throughout the region during most months of the year. There were 55 lions hunter harvested in 2010 and 1 nuisance removal. There continue to be 2 multiple bag areas in the region: Units 15BW, 15C, and 15D and Units 16AS and 18BS.

Units 15BW, 15C, and 15D have a harvest objective of 10 lions. There were 2 lions removed, by the contract hunter working for the ADBSS, in Units 15BW (male) and 15D (female) in 2010. 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 the multiple bag season structure for Units 15BW, 15C, and 15D are listed below. Region 3 will discontinue the multiple bag limit if:

- The number of sheep observed per hour of survey time reaches the long-term average (18.67 sheep per hour); and
- The observed sheep population exceeds 108 total; and
- Ten lions are removed through any combination of methods.

A multiple bag hunt structure was implemented in 2006-2007 in Unit 16AS and 18BS to benefit a recently transplanted population of bighorn sheep. Fifty-five bighorn sheep were released into the area. Although most of these sheep have remained in Unit 18BS, several sheep have relocated across U.S. Highway 93 into Unit 16AS where there is also a lion population. There have been 2 mortalities, but neither could be attributed to lion predation. In 2010, there were 3 lions removed from Units 16AS (female) and 18BS (male, female).

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During 2010-2011, the Kingman regional office continued to respond to nuisance lion reports in various locations. The number of calls may be artificially inflated by the monitoring efforts of Research Branch on mountain lions radio-collared in the Prescott area. Reports of mountain lions adjacent to housing developments are common due to increased housing density near National Forest lands.

**Region 4**

The Region has 3 lion hunt areas with harvest limits.

In 2005, we established a multiple bag structure in Unit 40A and set a harvest limit of 4 lions. We hoped that the setting of a multiple bag with a harvest limit greater than 1 would encourage an increase in the sport take of mountain lions and provide some protection to the depressed bighorn sheep population there. A female lion was reported taken in this unit in 2008. This was the first since the multiple bag structure was set. None have been reported taken since.

In 2006, the Region established a multiple bag structure for the southern portion of Unit 42 with the setting of a harvest limit of 2 lions. Bighorn sheep were reintroduced to the Big Horn Mountains in November 2005 and supplemented in 2007 and 2010. A number of radio-collared sheep have since been killed by lions. This unit has been open for the harvest of mountain lion in the past, but rarely are any harvested. A temporary reduction in mountain lion numbers in the unit's bighorn sheep habitat may reduce predation on the sheep and help them recover to a self-sustaining population level. The multiple bag structure will be discontinued when the bighorn sheep population in Unit 42 reaches a self-sustaining level of 100 or if evidence indicates that less than 10% of radio-collared bighorn sheep mortality can be attributed to mountain lion predation. No lions were reported taken in Unit 42 in 2010.

In 2009, the Region established a multiple bag area in the eastern part of Unit 44A. This unit has had a number of translocations of sheep between 1994 and 2001 to try to reestablish or supplement small remnant herds in the Harcuvar, Granite Wash, and Harquahala mountains. Numerous depredations by lions on radio-collared sheep have been documented and the sheep populations have failed to thrive, at least partly, because of the predation problems. Overall, 54% of sheep mortalities that were investigated were attributed to mountain lion predation. The unit has been open for the harvest of mountain lion, but rarely are any harvested. In the 5 years before the multiple bag was established, only 3 lions were reported taken in 44A. The harvest objective has been set to 4 lions. The objective will be discontinued when the bighorn population in this portion of Unit 44A reaches a self-sustaining level of 300. The current population estimate is 55. Two male lions were reported taken in this area in 2010 and 2 in spring 2011. The fourth lion of the season was taken and a multiple bag limit was reached for the first time in Arizona. The unit then reverted to statewide limits for take of mountain lion.

Units 45A, 45B, 45C, 46A, and 46B are national wildlife refuges and are closed to lion hunting. The remainder of the Region is open to lion hunting. In 2010, 9 lions were reported taken by sport hunters in the Region: 4 males and 2 females in Unit 20C, and 2 males and 1 female in Unit 44A. So far in 2011, 2 lions have been taken in Unit 44A.

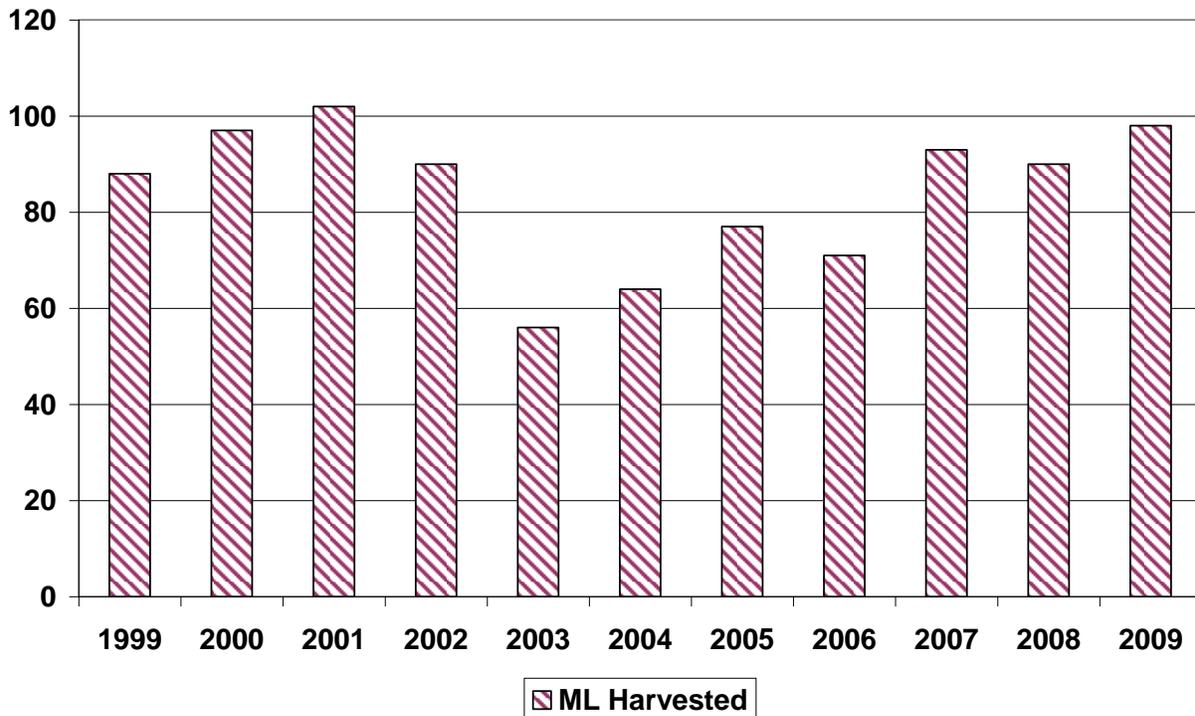
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Because of concerns about lion predation on bighorn sheep in the Kofa National Wildlife Refuge and surrounding mountains, an Adaptive Predation Management Plan was developed for that area and is currently being implemented.

**Region 5**

Hunter harvest of 91 lions (52 male, 39 female) were reported in Region 5 in 2010. Harvest in Region 5 has been higher the last 3 years than in the 4 years previous, but this higher level is consistent with historical harvests in the region. In 2010, Region 5 represented 38% of the state's unfer lion harvest. Twenty-nine additional lions were taken in the region under the depredation law. For 2011, Region 5 will have Units 31, 32 and 37B be included in the “multiple bag” hunt structure.

**Sport Harvest of Mt. Lions in Region 5**



**Region 6**

During 2010, 32 lions were killed (24 males and 8 females). Three lions were killed in Unit 22 South. Triggers for the bighorn sheep population were established in Unit 22 South when the unit went to a mountain lion multiple bag limit management strategy of 12 lions in 2000. Because these

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triggers have been met, the recommendation is for the Unit 22 South multiple bag limit to be discontinued.

Desert bighorn sheep triggers for Unit 22 South:

If annual (fall) October helicopter survey efforts detect > 70 desert bighorn (in 2009, 99 sheep observed) and when annual helicopter surveys indicate a lamb: 100 ewes ratio of > 26 for 2 successive survey years, (in 2006, 36 lambs: 100 ewes and in 2009, 33 lambs: 100 ewes) the mountain lion multiple bag limit will be discontinued.

Unit 37B:

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 in northern Unit 37B. The Commission approved this multiple bag limit starting July 1, 2011.

Lion checks:

The Wildlife Program in Region 6 checked in 30 lions for fall 2010-spring 2011 hunting season. The majority of hunters called the Mesa Office before bringing in their lion. There were only a few lions that remained frozen that made removing a tooth and sexing difficult.