

## 2018 Mountain Lion Proposal Justifications

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### MONTANA FISH, WILDLIFE & PARKS HUNTING SEASON / QUOTA CHANGE SUPPORTING INFORMATION

**Species: Mountain Lion**

**Region: 3**

**Hunting District: 322/326/330 and 323/324/325/327**

**Year: 2018**

1. Describe the proposed season / quota changes and provide a summary of prior history (i.e., prior history of permits, season types, etc.)

*Lion Management Unit 322/326/330* - Increase the quota from 6 to 7 any legal mountain lion with a female sub-quota of 2.

*Lion Management Unit 323/324/325/327* - Increase the quota from 6 to 7 any legal mountain lion with a female sub-quota of 2.

**Table 1.** Lion Management Unit 323/324/325/327 lion quotas and harvest, 1995-2017.

HUNT YEAR	FEMALE QUOTA	FEMALE TAKEN	MALE QUOTA	MALES TAKEN	QUOTA TOTAL	TOTAL HARVEST	SEASON CLOSED
1995	2	1		2	3	3	12/30/95
1996	2	1		2	3	3	2/5/97
1997	3	3		2	6	5	2/15/98
1998	3	3		3	6	6	1/13/99
1999	3	2		3	6	5	
2000	3	2		3	6	5	
2001	3	2		2	6	4	12/31/01
2002	3	2		4	6	6	1/7/2003
2003	3	3		1	6	4	4/14/2004
2004	3	2		4	6	6	2/9/2005
2005	1	1		4	6	5	4/14/2006
2006	1	0		4	4	4	1/10/2007
2007	1	1		2	4	3	4/14/2008
2008	1	2		2	4	4	1/25/2009
2009	1	1		3	4	4	1/11/2010
2010	1	0		1	4	1	4/14/2011
2011	1	1		2	4	3	4/14/2012

2012	2	0		4	4	4	12/27/2012
2013	2	2		2	4	4	1/3/2014
2014	2	1		2	6	3	4/14/2015
2015	2	2		2	6	4	4/14/2016
2016	2	2		3	6	5	4/14/2017
2017	2	2		4	6	6	12/30/2017

**Table 2.** Lion Management Unit 322/326/330 lion quotas and harvest, 1995-2017.

HUNT YEAR	FEMALE QUOTA	FEMALE TAKEN	MALE QUOTA	MALES TAKEN	QUOTA TOTAL	TOTAL HARVEST	SEASON CLOSED
1995	2			3	3	3	1/6/96
1996	2			3	3	3	1/7/97
1997	3	1		4	6	5	12/17/97
1998	3	2		4	6	6	12/14/98
1999	3	2		5	6	7	1/14/00
2000	3	1		4	6	5	
2001	3	4		3	6	7	12/31/01
2002	3	2		4	6	6	1/26/2003
2003	2	2		1	6	3	4/14/2004
2004	2	1		1	6	2	4/14/2005
2005	1	1		2	2	3	12/16/2005
2006	1	1		1	2	2	12/6/2006
2007	0	1		1	2	2	12/28/2007
2008	0	0		2	2	2	2/1/2009
2009	0	0		2	2	2	2/6/2010
2010	0	0		2	2	2	1/3/2011
2011	0	0		4	2	4	12/24/2011
2012	2	0		4	4	4	1/30/2013
2013	2	2		2	4	4	12/28/2013
2014	2	1		3	6	4	4/14/2015
2015	2	1		5	6	6	1/26/2016
2016	2	2		2	6	4	4/14/2017
2017	2	2		4	6	6	12/19/2017

## 2. Why is the proposed change necessary?

The quota increase is being proposed to account for: 1) increased hunter access to lions in the Blacktail Mountain and Sweetwater Hills; 2) to address landowner complains regarding high lion populations; 3) address high lion populations; and 4) provide added harvest opportunity to houndsmen.

**3. What is the current population's status in relation to the management objectives? (i.e., state management objectives from management plan if applicable; provide current and prior years of population survey, harvest, or other pertinent information).**

The population is currently exceeding social tolerance of landowners and big game hunters.

**4. Provide information related to any weather/habitat factors that have relevance his change (i.e., habitat security, hunter access, vegetation surveys, weather index, snow conditions, and temperature / precipitation information).**

Access to the lion management unit is sufficient to allow for the proposed harvest quota while at the same time seasonal travel restrictions, snow depth and topography allow for large tracts of sanctuary for lions. Lion harvest will be the product of snowfall frequency and accumulation.

**5. Briefly describe the contacts you have made with individual sportsmen or landowners, public groups or organizations regarding this proposal and indicate their comments (both pro and con).**

Feedback regarding mountain lion harvest quotas was solicited through the Sheridan area wildlife biologist's email distribution list. This list includes 130 sportsmen, non-sportsmen, private property owners, livestock producers, sportsmen groups, and local politicians, and are Game Wardens. Nine comments were received from 5 houndsmen, 3 big game hunters, and one landowner. All were supportive of the proposed quota increase. The proposal was presented the Houndsmen's Association's annual meeting in Three forks on March 22. No comments or questions were received.

Submitted by: Dean J. Waltee  
Date: 22 March 2018

Approved: \_\_\_\_\_  
Regional Supervisor / Date

Disapproved / Modified by: \_\_\_\_\_  
Name / Date

Reason for Modification:

**MONTANA FISH, WILDLIFE & PARKS**  
**HUNTING SEASON / QUOTA CHANGE SUPPORTING INFORMATION**

**Species: Mountain Lion**  
**Region: 5**  
**Hunting Districts: 530/590**  
**Year: 2018**

**1. Describe the proposed season / quotas changes and provide a summary of prior history (i.e., prior history of permits, season types, etc.).**

*Increase the total mountain lion quota in HD530/590. The total quota was last changed in HD530/590 in 2014-15 (Table 1).*

Change From:

General Lion Licenses  
 Harvest Quota: 8 Any Legal Lion.  
 Dec 01-Apr 14

Change To:

General Lion Licenses  
 Harvest Quota: **10** Any Legal Lion  
 Dec 01-Apr 14

Table 1. Mountain lion quotas, harvest and season closure dates for HD 530/590, 1996-97 through 2017-18 season.

Season	Total Quota	Harvest			Quota Filled	Date Closed
		Male	Female	Total		
1996/97	3	0	0	0	No	
1997-98	3	1	2	3	Yes	Jan-15
1998-99	5	1	1	2	No	
1999-00	5	3	1	4	No	
2000-01	5	1	1	2	No	
2001-02	5	1	2	3	No	
2002-03	5	1	0	1	No	
2003-04	5	0	1	1	No	
2004-05	5	1	3	4	No	
2005-06	5	1	0	1	No	
2006-07	5	3	1	4	No	
2007-08	5	2	0	2	No	
2008-09	5	3	0	3	No	
2009-10	5	4	1	5	Yes	Feb-18
2010-11	5	0	0	0	No	
2011-12	5	2	3	5	Yes	Dec-10
2012-13	5	3	2	5	Yes	Feb-23
2013-14	5	4	3	7	Yes	Feb-1
2014-15	8	4	1	5	No	
2015-16	8	1	0	1	No	
2016-17	8	2	3	5	No	
2017-18	8	3	5	8	Yes	Jan -17

The 1996/97 season was the first year that HDs 530 and 590 were grouped together as a separate lion management area. The quota was set at 3 lions for the 1996/97 and 1997/98 seasons but was increased to 5 lions (no female sub-quota) beginning with the 1998/99 season. In 2011/12 five lions were harvested and the season closed on December 10. In 2012/13 the quota was again achieved with 3 males and 2 females being taken. In 2013-14, we went over quota with 4 males and 3 females harvested and the season closed on February 1, 22 days earlier than the previous season. In 2014-15, 4 males and one female were harvested. The males were 1, 2 and two lions' age couldn't be

determined but the female was 9 years old. In 2015-16, one male lion was harvested and was 4 years old. In 2016-17, 2 male lions and 3 females were harvested. The males were aged 2 and 4 while the females were two yearlings and a 3-year-old.

Prior to the 1988/89 season no mountain lions had been harvested from either HD 530 or 590. Since the 1988/89 season 71 lions (41 males, 30 females) have been taken with 50% (36 of the 71 lions) coming in the last 7 seasons. Thirty-eight of the 71 (54%) hunter killed lions have come from HD 530. Thirty-six lions have been killed by hunters in HD 590 – with 22 of the 36 (61%) being taken in the last 5 years. Sightings of lions and lion sign have been increasing along the Musselshell River and in the Bull Mountains in recent years. Lack of reliable snow cover and the broken ownership (i.e. many different landowners) are the major impediments to harvesting lions in the Bull Mountains. A nuisance lion was killed in HD 590 in May of 2008 and another in December 2010. Increasing the quota will allow more harvest if/when snow conditions are favorable. Landowners in the area support an increased lion harvest, and FWP would like to keep lion conflicts to a minimum in this area.

The rate of lion harvest (lions killed/day of season) can be an indicator of population size or trend. While the current lion season runs through April 14 unless the quota is filled, prior to 1998 lion season ended on February 15 each year. Therefore, in order to compare harvest rates over time only the period between December 1 and February 15 can be evaluated. In HDs 530/590 harvest rates remained steady through 2009 then started to increase (Figure 1). These data would suggest that lion densities may be increasing but remain near the low end of the density gradient. The quota of 8 lions may be low.

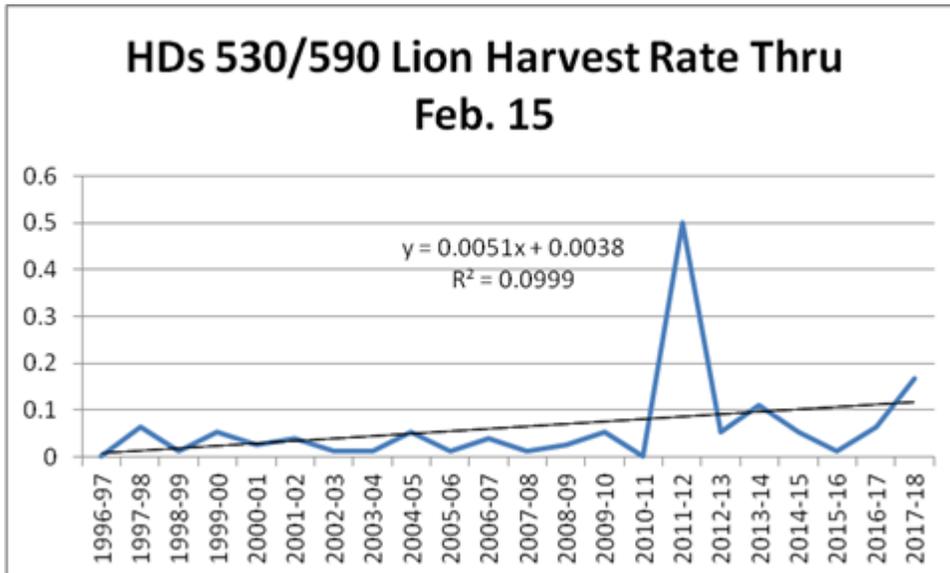


Figure 1. Lions harvested per day in HDs 530-590 From December 1 through February 15<sup>th</sup> 1996-2018.

**2. What is the objective of this proposed change? This could be a specific harvest amount or resulting population level or number of game damage complaints, etc.**

The objective of the change is to maintain the lower number of landowner complaints about mountain lions around their buildings. We achieved this lower number in recent years following the last quota increase. Lion harvest, especially in the prairie environment, is likely more a function of good snow conditions than lion population size. 2011 was a big snow year and there were a lot of lions killed in these districts. 2014 was also a pretty good snow year. Historically, 1996-97 was a good snow year and there was no lion harvest. So, I think it's fair to say that lion numbers have increased in HD530/590 in the last couple of decades despite the lack of significance of the trend line.

**3. How will the success of this proposal be measured? This could be annual game or harvest surveys, game damage complaints, etc.**

Success will be measured by maintaining the lower number of landowner complaints about mountain lions around their buildings. We achieved this lower number of complaints in recent years following the last quota increase. Success will also be measured by using lion hunters to manage mountain lions and nuisance mountain lions in these hunting districts and not having to take that opportunity away by using Wildlife Services or FWP to deal with nuisance mountain lions.

**4. What is the current population’s status in relation to the management objectives? (i.e., state management objectives from management plan if applicable; provide current and prior years of population survey, harvest, or other pertinent information).**

The regional objective is to maintain healthy mountain lion populations and to maximize a landowner’s ability to manage lions in a manner that is compatible with his livestock operation. Increasing the quota will allow more harvest if/when snow conditions are favorable. Landowners in the area support an increased lion harvest, and FWP would like to keep lion conflicts to a minimum in this area. Adjacent hunting districts in Region 7, with similar habitats, have also seen an increase in mountain lion harvest in recent years and have increased their quotas accordingly.

**5. Provide information related to any weather/habitat factors that have relevance to this change (i.e., habitat security, hunter access, vegetation surveys, weather index, snow conditions, and temperature / precipitation information).**

*Snow condition survey information:* Winter conditions over the last two years have been near average to more mild than average. The winter of 2017-18 was ideal for lion hunting and 8 lions were harvested and the season closed Jan. 17. The earliest season closure since the winter of 2010-11.

*Describe access problems related to change, etc.:* Sightings of lions and lion sign have been increasing in the Bull Mountains and along the Musselshell River in recent years. Lack of reliable snow cover and the broken ownership (i.e. many different landowners) are the major impediments to harvesting lions in the Bull Mountains and along the Musselshell River.

*Overwinter survival information (i.e. bad winter lost what % of population):* Winter severity doesn’t appear to be a factor in this population’s trend. Whitetail and mule deer numbers are also up in these two hunting districts providing an abundant prey base.

**6. Briefly describe the contacts you have made with individual sportsmen or landowners, public groups or organizations regarding this proposal and indicate their comments (both pro and con).**

No comments have been received in opposition of the proposal from landowners or sportsmen. This proposal was presented to the area wardens. No conflicts with landowners, sportsmen or other members of the public are anticipated.

**Submitted by:** Ashley Taylor  
**Date:** 3/8/2018  
**Approved:** \_\_\_\_\_  
Regional Supervisor / Date

**Disapproved / Modified by:** \_\_\_\_\_  
Name / Date

**Reason for Modification:**

**MONTANA FISH, WILDLIFE & PARKS**  
**HUNTING SEASON / QUOTA CHANGE SUPPORTING INFORMATION**

**Species: Mountain Lion**  
**Region: 3**  
**Hunting District: 380**  
**Year: 2018-19**

**3. Describe the proposed season / quotas changes and provide a summary of prior history (i.e., prior history of permits, season types, etc.).**

The proposal is to decrease the total mountain lion quota from 10 to 5 in the district and to decrease the female sub-quota from 4 to 2.

Table 1. HD 380 mountain lion harvest information.

Season Year	Total Quota	Female Sub-quota	Harvest		Total Harvest	% Female Q. Filled	% Total Q. Filled	Season Closures
			M	F				
2017	10	4	2	3	5	50%	50%	Didn't close
2016	10	4	4	5	9	100%	90%	Female close 12/22/16; all closed 1/24/17?
2015	6	2	4	4	8	200%	133%	Female closed 12/19/15; All closed 12/22/15
2014	6	2	6	1	7	50%	116.7%	All closed 12/19/14
2013	6	2	3	3	6	150%	100%	Female closed 12/14/13; All closed 12/16/13
2012	6	2	5	4	9	200%	150%	Female closed 12/13/12; All closed 12/15/12

\*Prior to 2012 HD 370 was combined with HD 380 into one mountain lion management zone.

**4. What is the objective of this proposed change? This could be a specific harvest amount or resulting population level or number of game damage complaints, etc.**

The objective of the proposal is to affect an increase in mountain lion numbers in HD 380. Area houndsmen are adamant that mountain lion numbers in HD 380 are down considerably. Despite good snow tracking conditions for most of the winter, houndsmen reported not finding much for mountain lions in HD 380 this past winter. The district remained open for the entire season (given expected weather conditions for the rest of the season little to no additional lion harvest is expected) this year for the first time since 2005. Since then the district has typically closed sometime in December.

**5. How will the success of this proposal be measured? This could be annual game or harvest surveys, game damage complaints, etc.**

Mountain lion harvest information will be monitored via mandatory checks and MFWP's MRRE system. Future comments from houndsmen, landowners and hunters may help indicate what if any impact the quota changes have on the management zone's mountain lion population; although, the utility of lion sightings, houndsmen efforts, etc to actually detect a change in mountain lion populations is quite questionable (Robinson and Desimone 2011). Ages of harvested mountain lions will be monitored via pulled teeth to determine if the age structure of the mountain lion population particularly that of the male segment is being impacted because of the quota change. In addition, age information on harvested females can give us an idea of the percentage of adult females in the harvest which may provide an indication of harvest impacts on the overall population.

**6. What is the current population's status in relation to the management objectives? (i.e., state management objectives from management plan if applicable; provide current and prior years of population survey, harvest, or other pertinent information).**

There is currently no official population management objective for mountain lions in this management zone. The Department developed mountain lion population estimates for all the different mountain lion management zones in the state several years ago using a resource selection function (RSF) model (Robinson et al. 2013). However, these estimates have not been validated in the various districts across the entire state, so it's unknown how accurate they are in the different districts or eco-regions of the state – some recent research indicates that they may not be that accurate. An RSF generated total population estimate was made for HDs 370 and 380 combined (two districts used to be in the same zone up until 2012) which put the total lion population somewhere in the mid to high 30s with the number of adult lions being estimated at around 19. Based on the model, the population was felt to be relatively stable. Once again it is unknown how accurate the initial population estimates were and how accurate the model projections were.

Another way to estimate the lion population for the management zone area is to estimate the population size based on some crude density estimates. Looking at where mountain lions have been harvested in the past and overlaying potential mountain lion habitat based on vegetation and topography with mule deer and elk winter range information in the two hunting districts, it is estimated that there may be approximately 1,400 km<sup>2</sup> of potential winter mountain lion habitat in the management zone. Based on published mountain lion research done elsewhere in Montana and the western United States and Canada, it appears that a total independent mountain lion ( $\geq 1.5$  yrs) density of at least 1.5-2.0 lions/100km<sup>2</sup> of winter lion habitat may not be unreasonable for this area, which would yield a total estimated independent mountain lion population size of approximately 21-28 lions. At an estimated independent mountain lion population size of 21, a total quota of 5 lions would yield a harvest rate of approximately 23.8% (17.9% using a population size of 28) of the independent lion population which should be low enough to allow the population to recover.

Most lion populations typically have 2.5x – 3x as many sub-adult/adult females as sub-adult/adult males in the population. With that in mind, the estimated 21-28 independent mountain lions might be comprised roughly of 15-20 independent females and 6-8 independent males. If the female sub-quota of 2 were filled this would be a 13.3 - 10.0% harvest rate on the estimated number of independent females. Research indicates that around 20% total female mortality from all sources (hunting & non-hunting) is likely the threshold at which mountain lion populations start to decline, so again it is expected that the reduction in the female sub-quota should allow the population to recover.

Obviously, trying to extrapolate mountain lion densities to areas other than where the research was done must be approached with great caution. Mountain lion densities could be lower or greater than the numbers used above, which would of course impact population estimates. Unfortunately, not having any mountain lion population information, or having any mountain lion population research done in Montana east of the continental divide in habitats which may be similar to that found in the Elkhorn Mountains, makes making biologically sound management decisions related to mountain lions rather difficult.

**7. Provide information related to any weather/habitat factors, public or private land use or resident and nonresident hunting opportunity that have relevance to this change (i.e., habitat security, hunter access, vegetation surveys, weather index, snow conditions, and temperature / precipitation information).**

Lion habitat in the area is believed to be good overall with ample numbers of prey consisting of mule deer, white-tailed deer and elk among big game species. Good prey numbers likely provide incentive for mountain lions to immigrate into the area, if there are surplus numbers available from surrounding areas (some question as to where there are available lions from surrounding areas due to harvest rates in surrounding zones), which would help the area's mountain lion population to recover. Access in the zone varies with some areas of the HD having good access for lion hunting and other areas having relatively little to no access for lion hunting because of USFS road closures for big game winter range or landownership patterns make them difficult areas to hunt. There is some question as to whether the access limitations in the HD cover large enough geographic areas to provide refuge from harvest for some lions in the HD. If so, those areas could act as a source population for other areas with more motorized access that would act like mortality sinks in the HD. Weather conditions may negatively affect mountain lion harvest, however, weather conditions the last couple of years have afforded lion hunters ample opportunity to harvest any available mountain lions.

Overall (resident and nonresident) hunter opportunity would be decreased, as the quota change proposal would result in a decrease in both the total number of mountain lions and the number of female mountain lions allowed for harvest. When lion numbers are plentiful, the total quota and the female sub-quota are typically filled fairly quickly ('race' type situation) in the zone, if good snow conditions are present.

**8. Briefly describe the contacts you have made with individual sportsmen or landowners, public groups or organizations regarding this proposal and indicate their comments (both pro and con).**

MFWP personnel from R3 met with a group of Region 3 houndsmen on March 22, 2018 to visit about potential mountain lion changes in the Region. Houndsmen present at the meeting who hunted mountain lions in HD 380 were adamant that lion numbers were down significantly in the HD (similar input received from Townsend area houndsmen this winter) and that the lion quota needed to be reduced. Individuals were supportive of a significant reduction in the quota. Local wardens from whom feedback was received were supportive of or at least okay with the proposal.

Submitted by: **Adam Grove, Wildlife Biologist – Townsend**

Date: 3/23/18

Approved: \_\_\_\_\_  
Regional Supervisor / Date

Disapproved / Modified by: \_\_\_\_\_  
Name / Date

Reason for Modification: