Human-Cougar

Occurrence Summary 2015 – 2018

Human-Cougar Coexistence in the South Saskatchewan Region

NOVEMBER 2019

Alberta Government

Environment and Parks, Government of Alberta

Published December 2019

Human-Cougar Occurrence Summary 2015 - 2018

Photo Credit: Stan Hawes

ISBN 978-1-4601-4649-1

Table of Contents

List of Figures

NOVEMBER 2019

Alberta Government

Executive Summary

Four years (2015-2018) of occurrence data on human-cougar interactions were summarized for the South Saskatchewan Region (SSR) in Alberta. Over the four years there has been a decline in the number of human-cougar occurrences (HCO). Despite the decline and the fact the majority of interactions were relatively low risk in terms of public safety, serious incidents continue to occur. These include predatory attacks on livestock, domestic animals and wildlife. Attacks on wildlife are a concern as they often occur in or adjacent to developed areas such as residential properties or in areas frequented by people elevating the potential risk to the public. Developed areas adjacent to prime cougar habitat were most prone to having serious interactions with cougars. Such developments, whether they be urban residential or rural acreages, can provide cougars with an easy source of prey in the form of livestock or domestic pets. Acreage developments are increasing along with the prevalence of livestock such as chickens, llamas, alpacas, miniature donkeys, and goats. The highest number of occurrences were located in WMU 212 which includes the City of Calgary. These occurrences were predominantly Low in severity and were primarily interactions with cougars along the urban fringe and in urban green spaces within the city. The large networks of green spaces inside the city limits provides good habitat for cougars and because these spaces are connected to quality habitat outside the city limits, they offer cougars the opportunity to access urban areas from forested cover.

With the increasing levels of human activity in or adjacent to cougar habitat, cougars have begun to gain the attention of both the public and wildlife managers. Their activity is becoming more common in and around developed areas and while segments of the public have become reasonably tolerant of bears, they are less comfortable with the idea of cougars living in close proximity to their homes. As such there is a need to provide additional education and conflict prevention programs, similar to what has been done with respect to bears.

Introduction

Cougars are habitat generalists, making them among the most adaptable and wide ranging mammals in the world. Their range extends from northern Alberta and British Columbia to the southern tip of South America. Since 1971 when they were first declared a big game species, cougar populations have increased in numbers and expanded in distribution in Alberta. Approximately 2,050 cougars are estimated to exist in Alberta. Populations are highest in the mountains, foothills, and southern boreal forest (ESRD, 2012).

Although cougar populations in Alberta subsist primarily by killing deer, a wide variety of prey is incorporated into their diet. In west central Alberta, cougars killed and fed on a variety of wild prey including white-tailed deer, mule deer, moose, elk, bighorn sheep, mountain goats, feral horses, other cougars, wolves, coyotes, red foxes, lynx, black cougars, marten, beavers, porcupines, snowshoe hares, red squirrels, hoary marmots, grouse, ducks, Canada geese, and ravens (Knopff et al. 2010a). Cougars will also scavenge and often specialize on a particular prey species (Knopff and Boyce 2007).

Cougars are hunted under a quota system in the western portion of the SSR during the winter and in the fall with a general licence for the rest of the region, however, dogs are not permitted during these fall seasons. Landowners are permitted to harvest cougars on their private property year round. Under all scenarios, any cougar harvest must be registered with the province.

Although cougars are increasingly viewed positively, some surveys still indicate an almost irrational fear towards them (Knopff 2011). Recent research in Alberta has shown that cougars are capable of living in close proximity to human activity, perhaps more so than any other large carnivore in North America (Knopff 2011). Although people generally value cougars and want to conserve them, they also fear cougars and the potential threat they pose to pets, livestock and people (Riley 1998, Thornton 2007, Knopff 2011). This fear of cougars generally means that people have a low tolerance for maintaining cougars in close proximity to their homes. Consequently, support for cougar conservation is high as long as the animals themselves and the threats they pose are distant (Manfredo et al. 1998, Riley and Decker 2002, Knopff 2011).

Interactions and potential conflict between people and cougars occurs where the two species share the same landscape. Domestic animals (livestock and pets) are present in high numbers in many areas of cougar-human overlap and present an easy to kill source of prey. Cougars have been documented killing a wide variety of domesticated animals including: goats, sheep, cattle, horses, dogs, cats, turkeys, pigs, llamas, alpacas, and chickens (Cougar Management Guidelines 2005, Knopff 2010). Depredation events are more likely on properties abutting cougar habitat (Torres et al. 1996) and occur more frequently at night when cougars use habitat closer to rural

properties (Knopff 2011). The likelihood of depredation events can increase if domestic animals are left to roam free outside, particularly at night and cougars have been known to kill high numbers of animals in a single event – far more than what they would ever consume. Cougar conflict has been slowly moving east and northwards from the more traditional cougar habitat of the Rocky Mountains and Foothills areas of Alberta (Figure 1. ESRD 2012).

Cougars do not typically see humans as prey. Underweight and young, inexperienced cougars appear more likely to attack people (Beier 1991, Mattson 2007). Historically it has been believed that younger people or children under 16 years were more likely to be attacked than adult people (Beier, 1991). More recently, however, adults have been killed more often than children, perhaps because adults are more often alone (Torres 2005). While cougars are quite capable of killing people, they rarely do. There have been three to four attacks per year on people in North America since the beginning of the 1990's (Mattson 2007). Increasing cougar populations in many areas coupled with an expansion of human activity both living and recreating into cougar habitat has increased encounter rates and the frequency of cougar attacks, with half of fatal attacks occurring in the past 20 years (Sweanor and Logan 2009). There has been one human fatality due to a cougar attack in Alberta. In 2001, a woman was killed while cross-country skiing in Banff National Park.

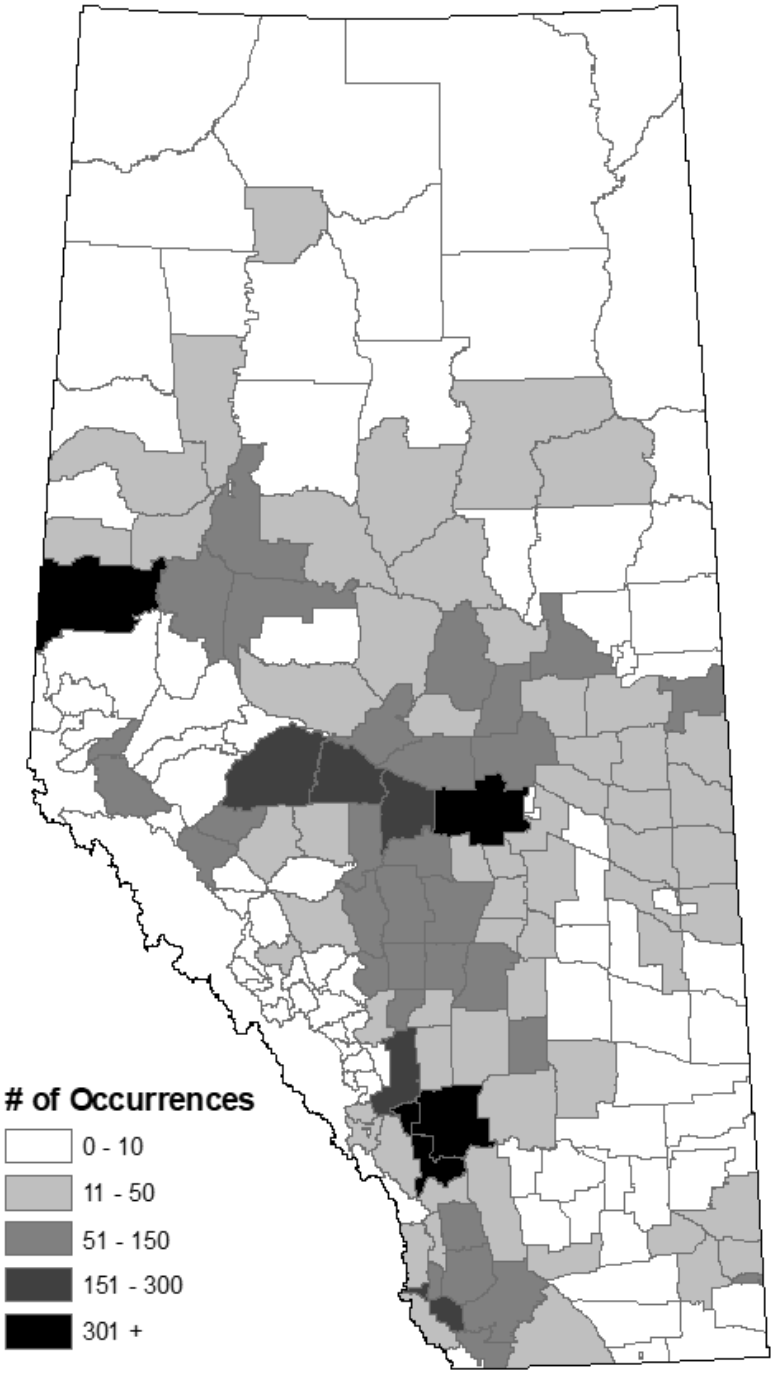

Figure 1. Distribution of provincial cougar occurrences

Study Area

The SSR study area includes the South Saskatchewan and Milk River basins. The region includes multiple cities, towns and villages, First Nations Reserves and numerous Parks and Protected areas. It accounts for 1.6 million people or 45% of the total population of Alberta. The SSR has a diversified economy that includes strong energy, agricultural, manufacturing, tourism and forestry sectors and a fast developing renewable energy industry.

The SSR includes six Natural regions including Grassland, Parkland, Foothills and Rocky Mountains. This diverse landscape extending eastwards from the Rocky Mountains to forested foothills to the prairies provides habitat for numerous fish, bird and plant species. Mammals such as moose, deer, elk, pronghorn, wolves, grizzly and black bears and cougars all exist within the SSR. The prevalence of healthy prey species results in a healthy cougar population, particularly within the western portion of the Region. Where human development exists, particularly in proximity to forested and riparian areas, human cougar interactions tend to exist.

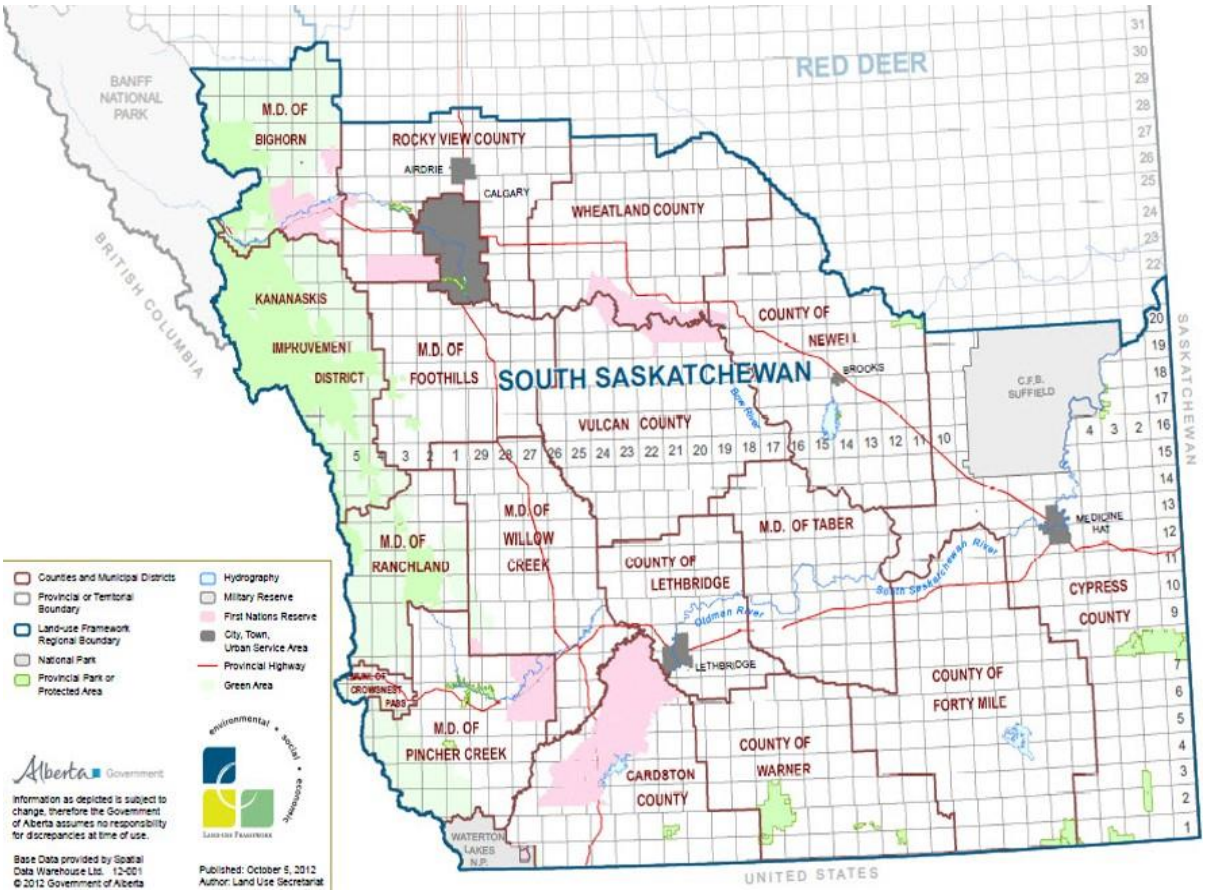

Figure 2. Area Boundary of the South Saskatchewan Region

Methodology

Cougar activity for the SSR was obtained from Government of Alberta (GOA) District Occurrence Reports for the period 2015 to 2018. Additional information from the Bow Valley and Kananaskis Country area was obtained from Kananaskis Emergency Services (KES) data. Cougar mortality records were obtained from GOA Cougar Registrations which are completed for every reported cougar death. In addition to the registration database, occurrence reports were searched for instances of cougar mortalities and then those were compared against to the registration database to search for mortalities that may not have been registered.

Occurrences where there was no potential public safety risk were not included for the purpose of this summary. These were primarily sightings of cougars in backcountry areas or undeveloped lands where no property damage issues occurred and there were no behavioral responses from the cougar towards the observer that created any concern for public safety. Generally, human-cougar occurrences for this report included;

1. incidents involving the killing of livestock/domestic animals,
2. cougars feeding on wildlife carcasses in areas frequented by people,
3. cougars attacking or demonstrating threatening behaviour towards people regardless of location or,
4. cougars presence in and around developed or residential areas where the presence of such animals creates a high risk to public safety.

Exact location information was rarely provided in occurrence reports but enough information was usually included in the narrative to allow a legal land location to be determined down to the quarter section. Therefore, to spatially analyze occurrence records that did not have specific locations, the centre point of each quarter section for each occurrence was used to plot locations.

In an effort to further evaluate the degree of severity and human risk associated with these human-cougar interactions, each occurrence was attributed a “severity level”. Information was extracted from each record on location, cougar behaviour, and food attractant in order to assign a severity level. Occurrences were assigned a severity level of Low, Moderate, High, Very High and Extreme. These risk levels are based on Aversive Conditioning Indices developed by the Wind River Bear Institute (WRBI, 1999). The intent of the severity level classification was to provide a clearer picture from a public safety/ property perspective of the cougar activity occurring in the Region. For definitions of severity levels, refer to Appendix II.

Results

After reviewing SSR District Occurrence Reports from 2015-2018 and removing general sighting records, 477 occurrences of human-cougar interactions remained. These occurrences were evaluated for their spatial and temporal trends, severity levels and attractant types. Mortality rates and their causes were also summarized.

Cougar Occurrences

The number of human-cougar occurrences across the SSR has been declining from a high of 165 in 2015 to 83 in 2018 (Fig 3).

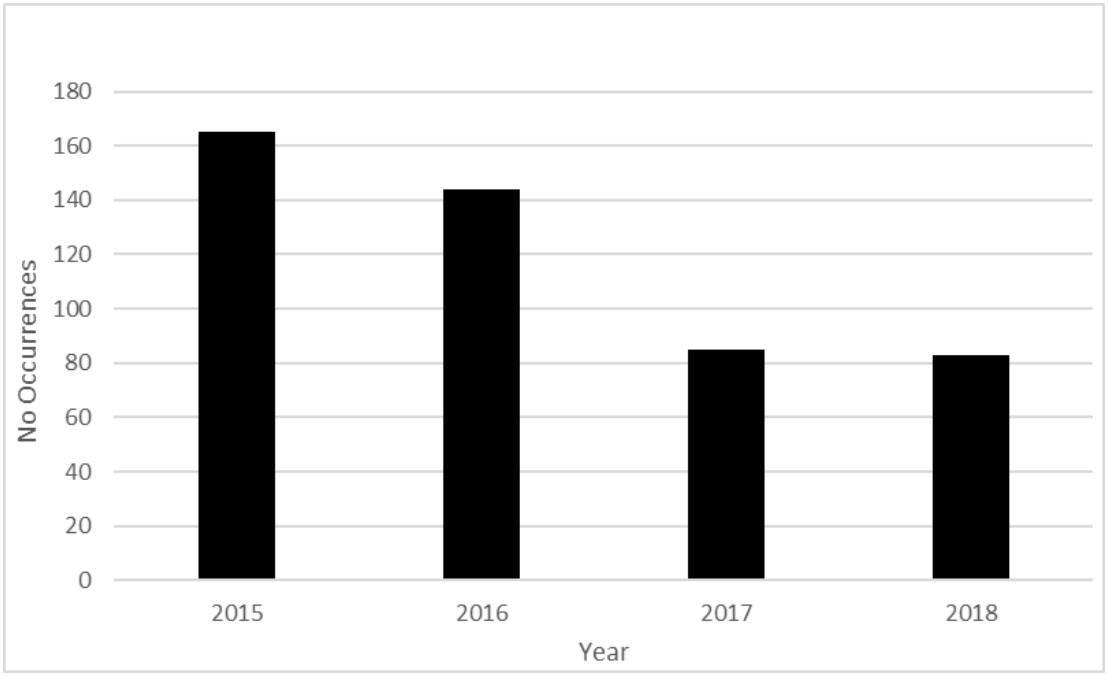

Figure 3. Annual number of cougar related occurrences (N= 475)

It is difficult to identify any one reason for the reduced number of HCO. Lower cougar numbers, less use by cougars of human dominated developed areas, and better awareness amongst the public on mitigating potential cougar conflicts are all possible contributing factors. Serious interactions such as attacks on people, livestock, or pets as well as incidents of cougars invading people's residential property are likely to continue being reported so it is not likely the reduction in occurrences can be attributed to a lack of reporting.

Cougar Mortality

Between 2015 and 2017, a total of 258 or an annual average of 86 cougars were registered or known to be killed in the SSR (Fig 4). Between 2015 and 2017, there were 12 occurrence records of cougars being found dead or killed that were not found in the registration database. Of the 245 mortalities where sex was known, 112 were females and 133 males.

Primary causes of mortality in cougar populations across the province vary depending on whether cougars are hunted or not. In the SSR, a large portion of the central and eastern portions of the region consist of prairie and parkland habitats which are less suitable for cougar.

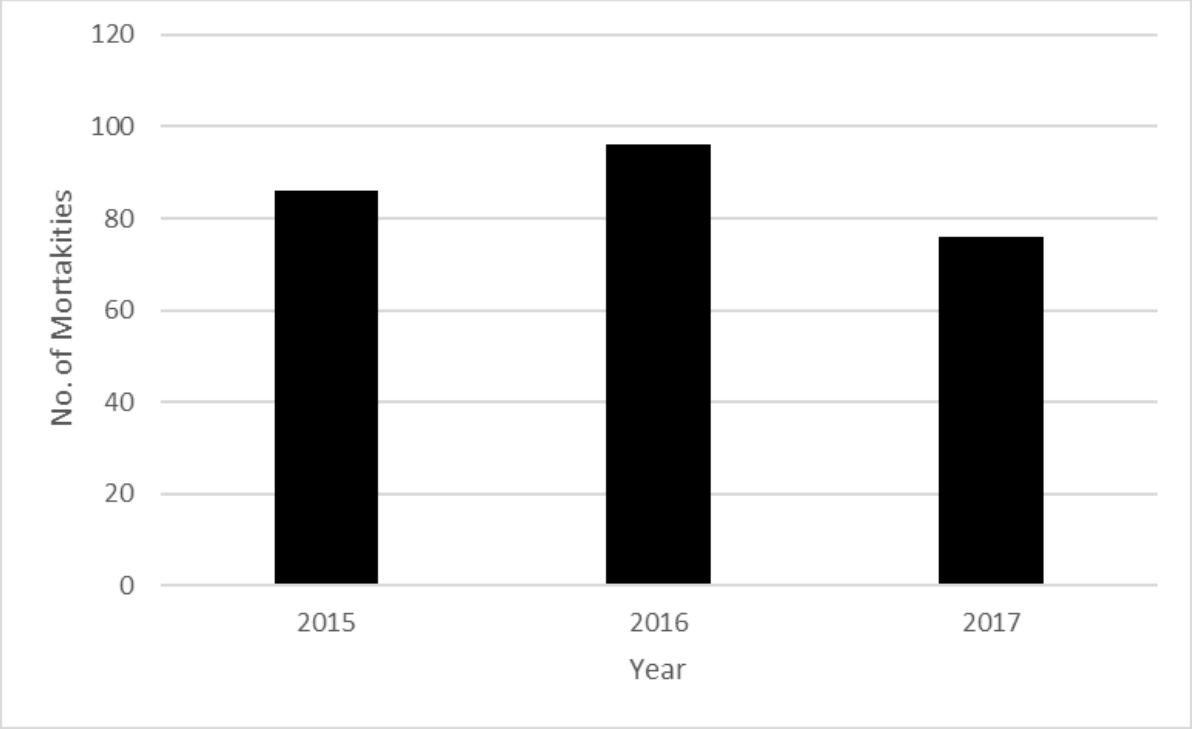

Figure 4. Annual number of known cougar mortalities (N= 258)

Where hunting exists, most adult cougars are killed by hunters (Anderson and Lindzey 2005, Lambert et al. 2006, Stoner et al. 2006, Cooley et al. 2009, Robinson and DeSimone 2011). In Alberta, hunting is the primary source of adult cougar mortality on provincial lands and the same was the case in the SSR (Fig 5). Legal hunting harvest accounted for 46% (119 of 258) of all mortalities followed by landowner harvest and accidental trapping at 25% (65 of 258) and 11% (29 of 258) respectively. Problem wildlife or management removals and road kills were next highest but both were less than 10% of the total. There were 3 instances of self-defense mortalities and all were hunter related. Landowner harvest were all related to landowners killing cougars on their private property usually in association with some kind of safety concern, livestock predation, or domestic pet attacks. Accidental trapping occurrences happened during the fur trapping season as collateral mortality from snares or leg hold traps set for other carnivores. There is no trapping season for cougars.

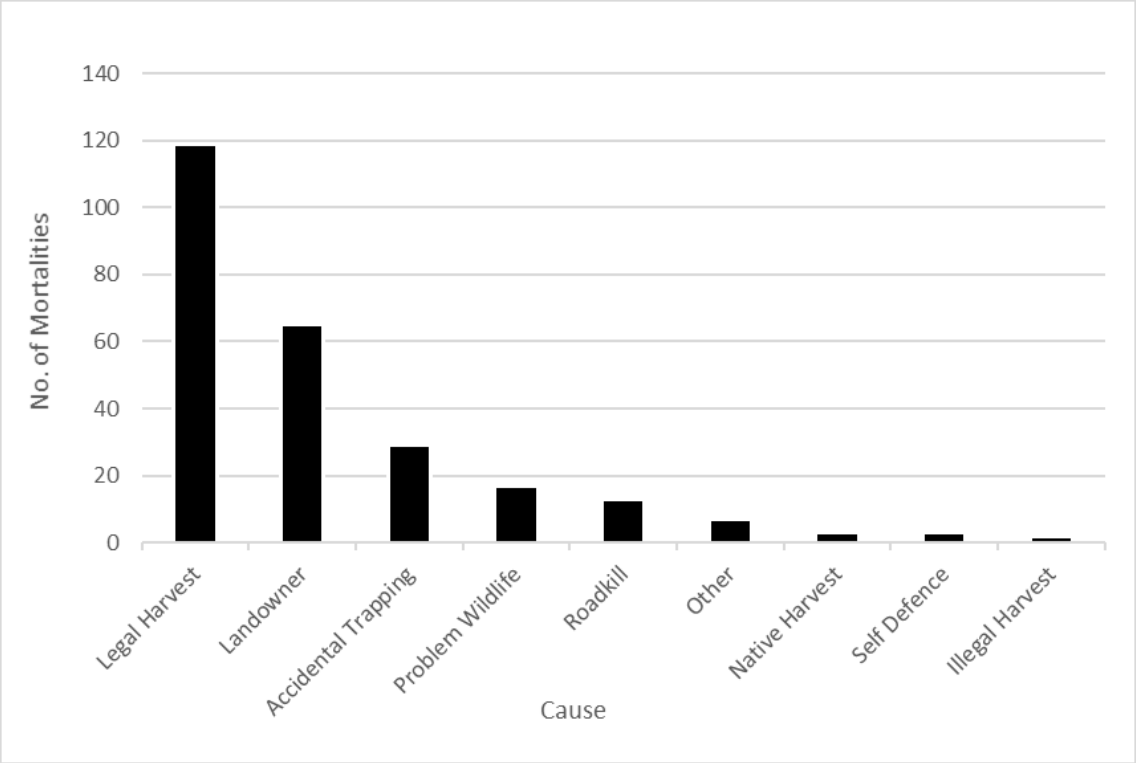

Figure 5. Causes of cougar mortalities (N= 258)

There were a higher number of accidental trapping mortalities in 2016 (19) than in the other years and more road kills in 2014 (7) than 2016 (2) and 2017 (4). Problem wildlife mortalities in 2017 (4) were slightly lower than 2016 (6) and 2015 (7).

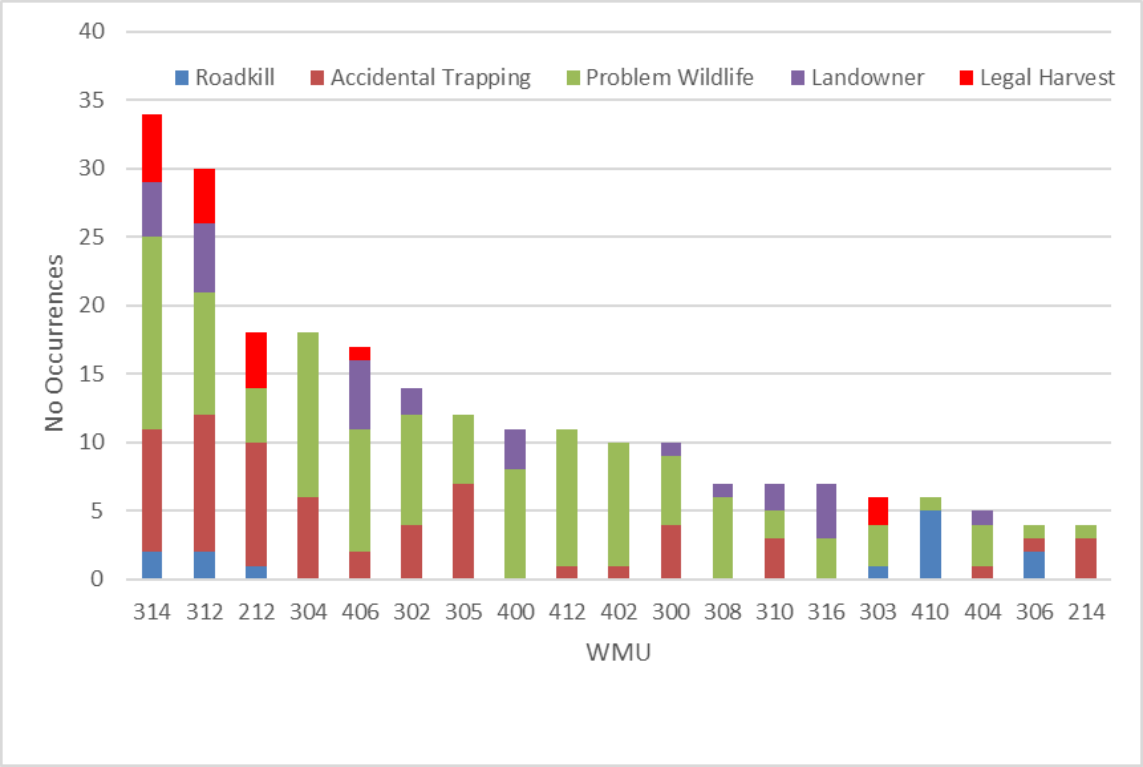

Figure 6. Major mortality causes by WMU (N= 231)

A summary of mortality cause between 2015 and 2017 by Wildlife Management Unit (WMU) is shown in Fig 6. WMUs 314 and 312 had the highest number of mortalities followed by 212, 304, 406, and 302. Hunting mortality and landowner harvest were the two greatest causes in most of the units. WMUs 212, 312 and 314 all had a disproportionate high number of accidental trapping mortalities. Problem wildlife removals were a common mortality source for WMU 314, 304 and 406. Of other note was the relatively high number of road kills in WMU 410 (6).

Human Cougar Severity Levels

In an effort to evaluate human-cougar occurrences into a metric of risk in relation to public safety concern and level of property damage, each occurrence record was assigned a severity level from Low to Extreme (see Appendix II for descriptions). Between 2015 and 2018, 475 occurrences were assigned a Severity Level. Many of the occurrences are situated in and around developments, particularly west of Calgary (Figure 7). The majority (47%) of the occurrences were Low; (Fig 8) primarily those of cougars frequenting residential areas, facility areas, and urban green spaces. The next highest conflict level was Very High (23% or 108 of 475) followed by High (19% or 91 of 475) and Moderate (11% or 52 of 475). There were no Extreme level occurrences (cougar injuring or killing a person) during this period.

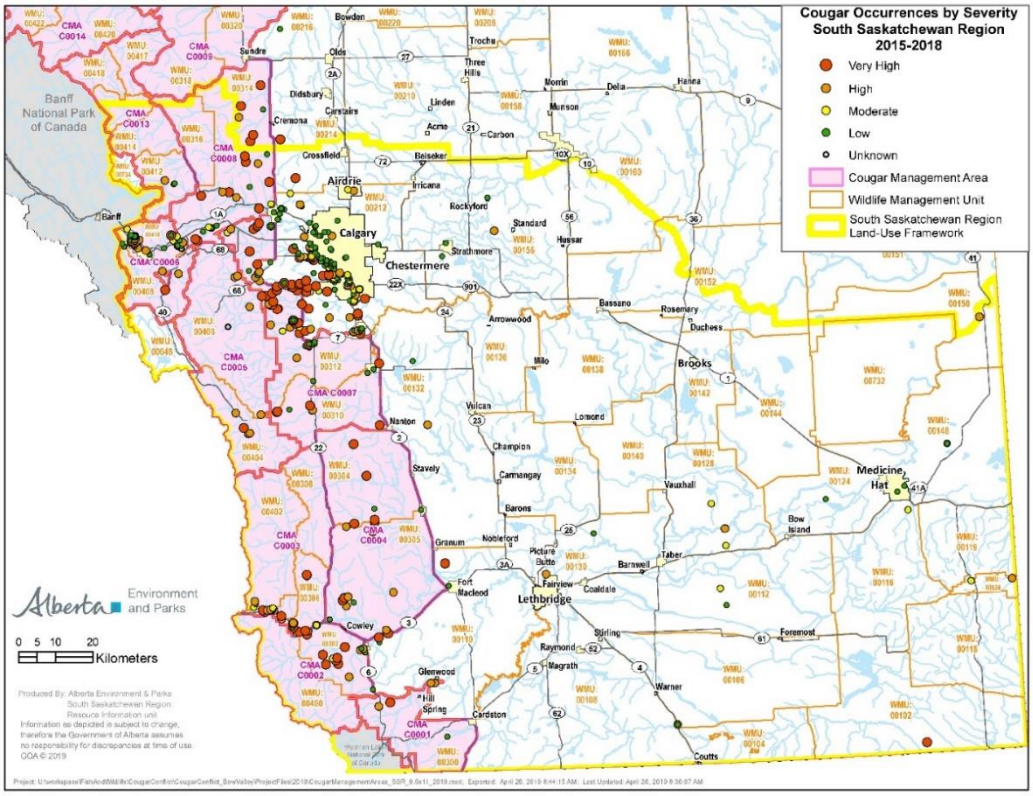

Figure 7. Human Cougar Occurrences by severity level (N= 475)

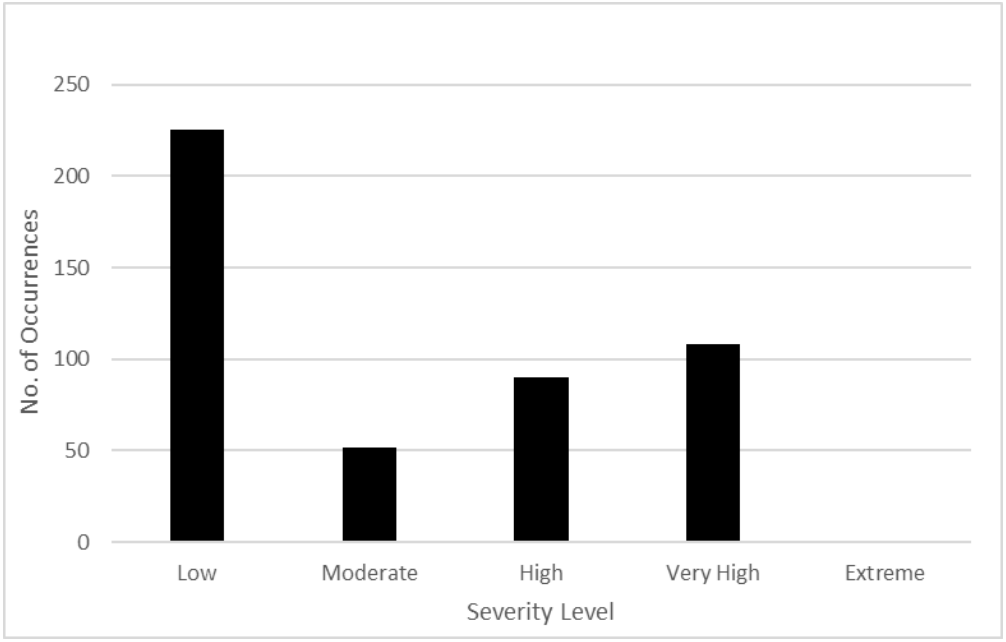

Figure 8. Severity levels for Human-cougar Occurrences (N= 475)

Very High occurrences typically involved cougars attacking livestock or domestic animals in developed areas. High level occurrences involved cougars chasing wildlife in residential areas or feeding on carcasses in developments such as residential areas, facilities/ playgrounds, urban green spaces and on trails. Additionally there were instances of cougars closing distance or approaching people that warranted a High ranking level. In many of these cases, dogs were with the observer and likely may have been attracting the cougar's attention. Moderate level occurrences were primarily cougars in residential yards on or under decks or cougars standing ground snarling or growling at people.

On an annual basis, the relative proportion of occurrences in each severity level during 2015 to 2018 is similar indicating that a consistent pattern exists in the type and severity of human-cougar occurrences from year to year.

Human-cougar occurrences took place throughout the year with peak frequency occurring in July and the month of December (Fig 10). High summer related occurrences likely coincided with higher levels of human activity and possibly young cougars learning to hunt for themselves.

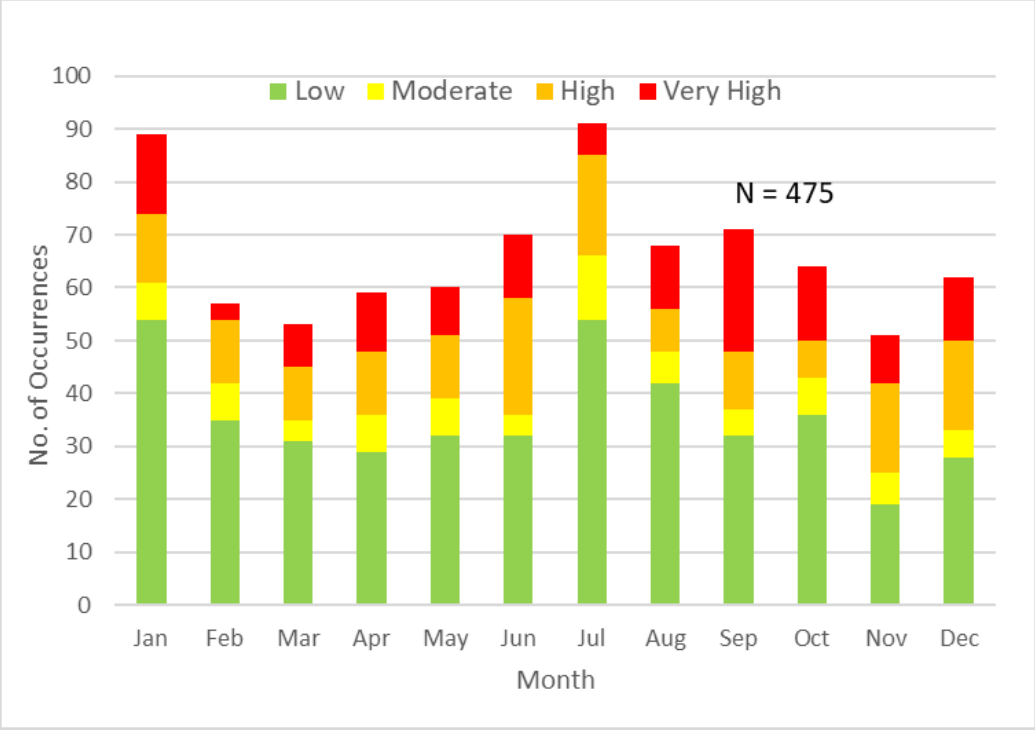

Figure 7. Monthly human-cougar occurrences by Severity Level (N= 475)

During summer, longer daylight hours, warmer temperatures, and a lack of snowpack to impede ease of movement all lead to higher activity levels of people especially related to recreational activities in cougar habitat for longer periods of time. The high winter occurrence activity is likely related to concentrations of ungulates in or near developed areas. Prey may also be limited and harder to come by forcing cougars to search for food in areas nearer to human activity centres and where livestock could become easy prey.

Location Type

Each occurrence was assigned a location type to identify the level and degree of human development associated with each human-cougar occurrence. Cougars more willing to intrude into human spaces would carry a higher level of potential risk to the public.

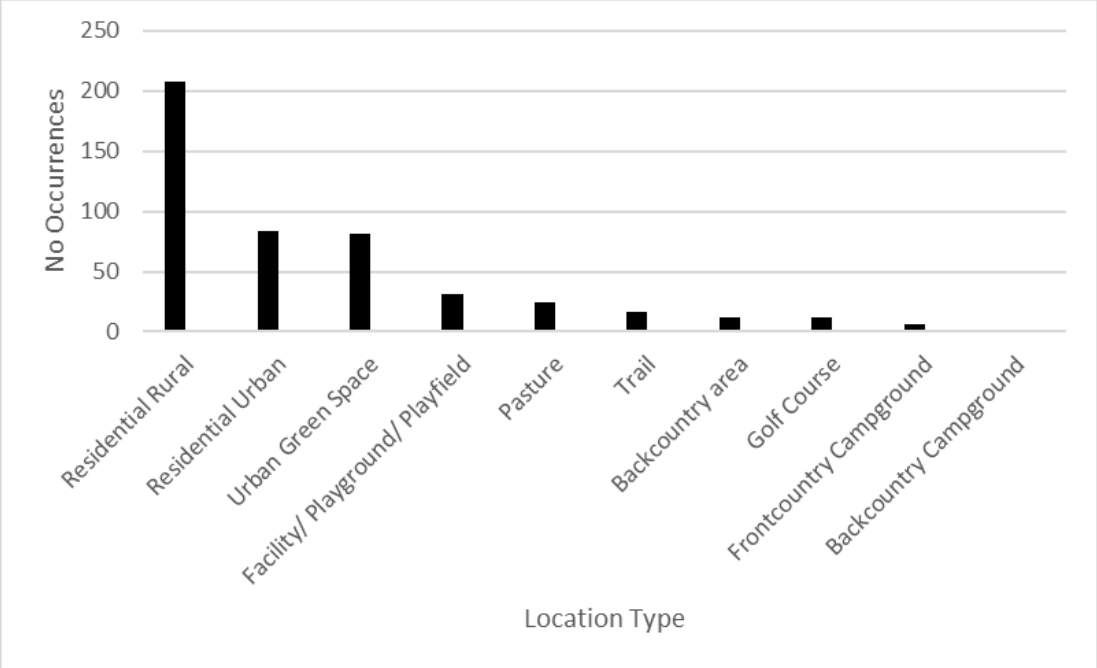

Figure 8. Occurrences by Location Type (N= 475)

Residential rural areas had by far the greatest proportion of human-cougar occurrences (HCO) over the 4 year summary period (44%, 208 of 475) (Fig 10). Residential Urban and Urban Green Space had the next highest proportion of occurrences at 18% and 17% respectively. All the remaining location types each contained less than 10% of the occurrences. It is not surprising that residential rural locations had the highest number of occurrences. These include farms, acreages, and other residential type communities where housing densities are very low and are located adjacent to and interspersed within prime cougar habitat. These residences are contained within home ranges of cougars and are visited regularly during a cougars search for prey.

Residential urban locations are residences that are part of high density housing developments found in communities from small hamlets like Bragg Creek to cities like Calgary and Lethbridge. Occurrences that took place in these urban residential areas are typically located along the urban fringes of development or were located adjacent to large urban green spaces such as parks and environmental reserves. Large parks such as Fish Creek Provincial Park and Nose Hill Park in Calgary present an opportunity for cougars to access urban developed areas that exist adjacent to these green spaces.

Spatial Distribution of Occurrences

By far, the majority of the 477 occurrences (37% or 175 of 477) during the 4 years were in WMU 212 followed by WMUs 312 (15% or 71 of 477), 410 (13% or 64 of 477), 314 (7% or 32 of 477), and 302 (5% or 25 of 477) (Fig 11). WMU 212 primarily includes the City of Calgary as well less developed lands adjacent to the city with significant acreage development.

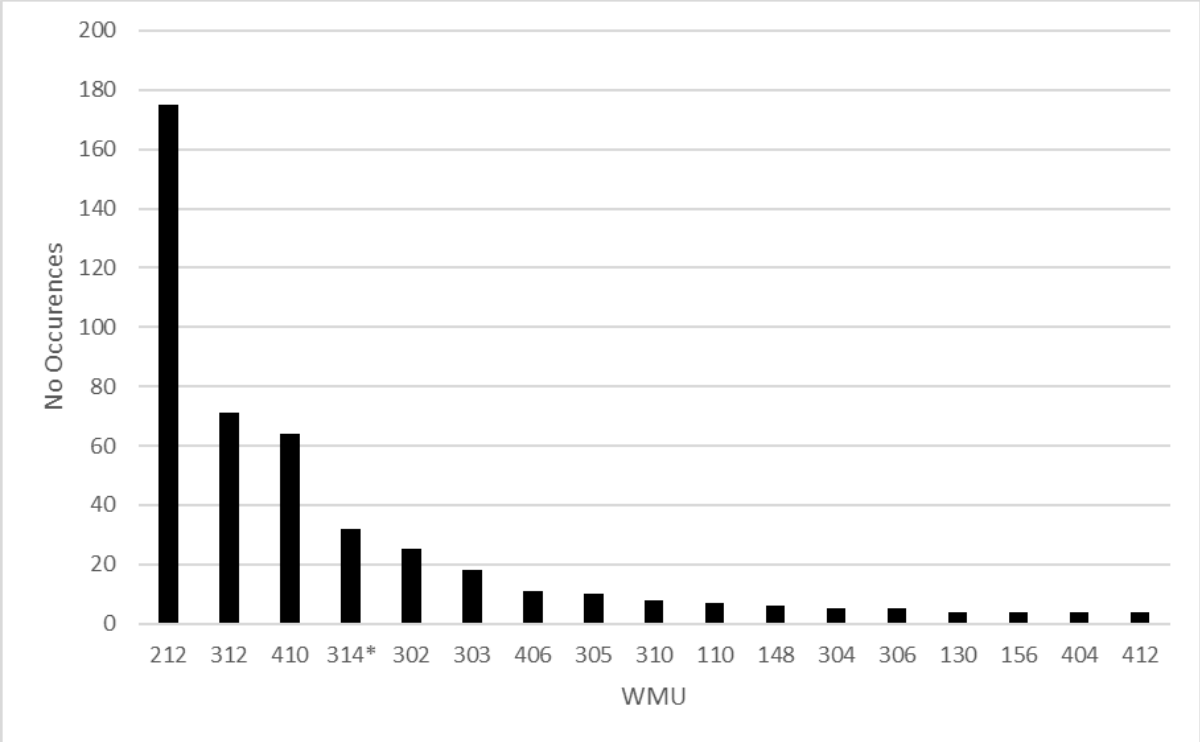

Figure 9. Number of Occurrences by WMU (N= 477)

Calgary has multiple large urban parks, interconnecting pathways and trails, 2 major river systems (Elbow and Bow rivers), and is rapidly expanding new housing developments into surrounding areas that provide good habitat for cougars. All these landscape features increase the human-cougar interface and increase opportunities for interactions.

For both WMUs 212 and 410, the majority of occurrences were of the Low level type while in most other units, Very High level occurrences were more common. WMU 410, the Bow Valley, has no agricultural component and is therefore not subject to cougar predation with livestock. It does, however, have a very high density of people living and recreating in a relatively small area that is utilized by cougars. Occurrences in this WMU are usually of encounters between people and cougars in and adjacent to developed areas and urban green spaces. These kind of interactions are considered Low severity (Fig 12).

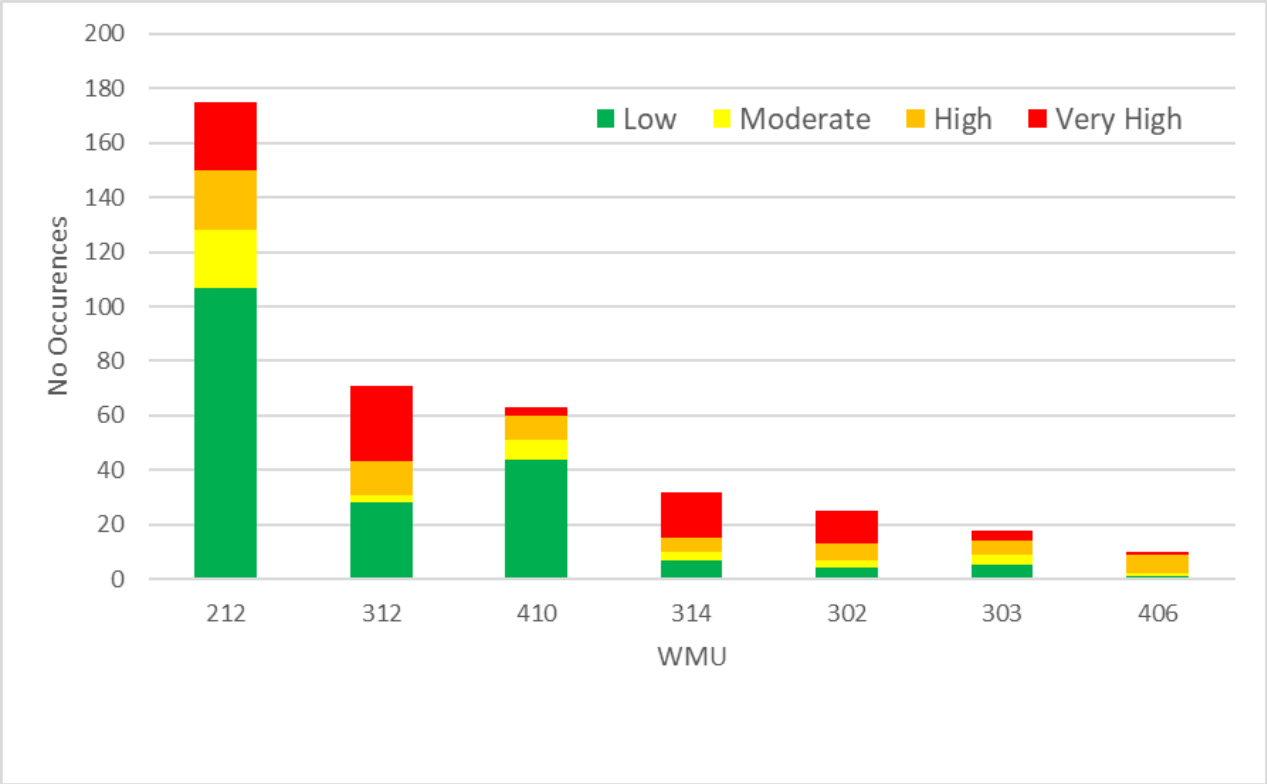

Figure 10. Severity Level of Occurrences within WMUs (N= 394)

The relatively high incidence of High and Very High occurrences in the other WMUs are mainly associated with cougars predating on livestock and to some degree on domestic animals. These WMUs are typically rural agricultural areas used for ranching and are also considered high quality cougar habitat. WMU 212 consists of the City of Calgary and the surrounding area, there were a number of High and Very High occurrences. These mostly were all associated with cougars attacking domestic animals e.g. dogs, cats, horse, goats, llamas on rural acreages.

Attractants

As mentioned earlier, cougars are attracted to areas with an abundance of prey species and attractants play a key role in increasing opportunities for interactions between cougars and people. Approximately half of the occurrences in the SSR between 2015 and 2018 involved some type of attractant. In the SSR between 2015 and 2018, the two attractants involved in most occurrences were domestic animals and livestock (Fig 13). Domestic animals were primarily dogs (80% or 60 of 75 occurrences) with 20% (15 of 75 occurrences) being cats.

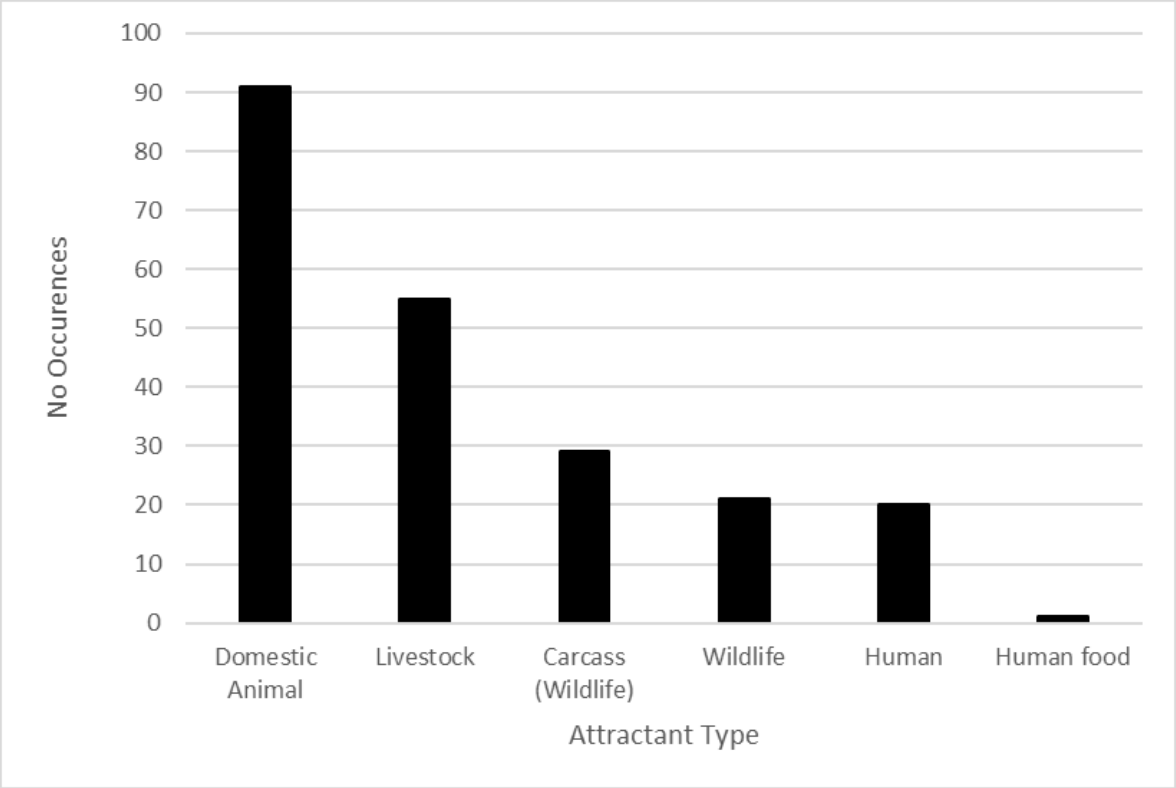

Figure 11. Attractants involved with Occurrences (N= 217)

Attractants involving livestock (25% or 55 of 217) included a variety of species but sheep were predominant (Fig 14) likely reflecting the ease with which these could be killed. Usually multiple sheep were killed during these instances. Horse or ponies were the next frequent species attacked but they were rarely killed and most often suffered wounds from claws.

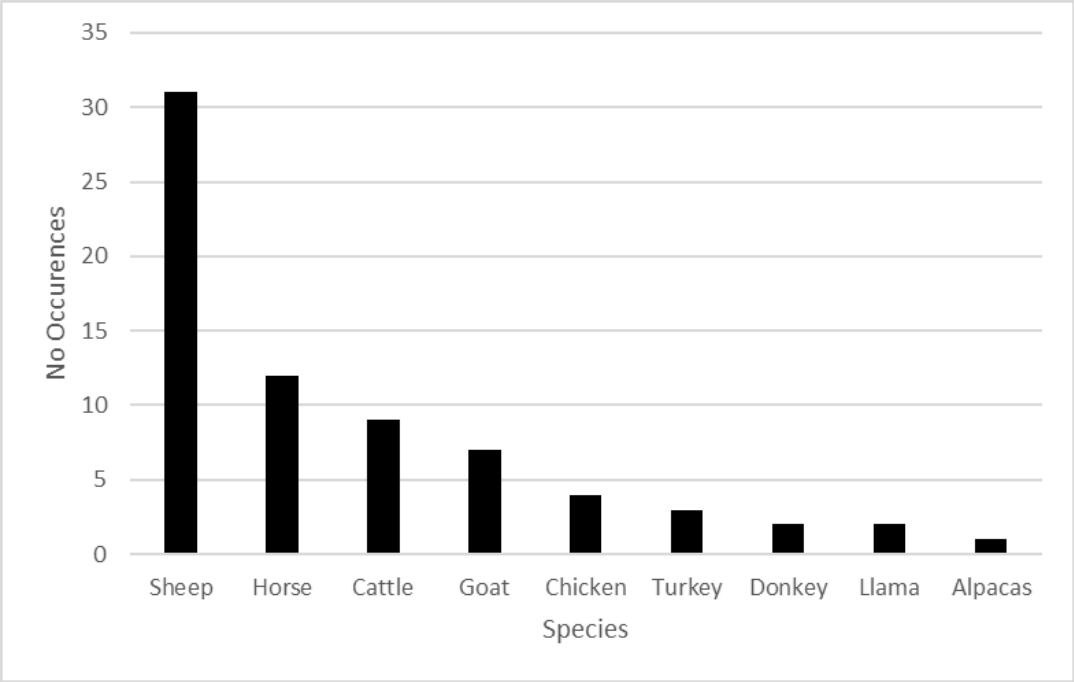

Figure 12. Species of Livestock involved in Human-cougar Occurrences (N= 71)

A horse is a fairly formidable prey animal for a cougar especially a young one. Cattle were the next most frequent prey and of the 9 cattle involved, 7 were calves, 1 yearling, and the other was of unknown age. Other livestock species included chickens, goats, turkeys, miniature donkeys and alpacas/llamas. Wildlife, whether animals being actively chased by cougars or already dead (carcass), were mostly deer. Elk, coyotes, bighorn sheep, and rabbits were the other primary wildlife species involved.

There were 20 instances of humans being identified as the primary attractant. These were occurrences of a cougar closing distance on a person or following the person for some distance. In some cases, the cougar would crouch, snarl or growl in a menacing manner. While it was not possible to ascertain the cougar's intention, it was reasonable to believe that the person may have been the attractant. They included instances where the person was not with a dog or other animal that otherwise may have been considered the attractant.

Cougar Behaviour

Behavioural activity of cougars was recorded whenever possible during human-cougar interactions. Some were in response to being observed by a person while others were when cougars were unaware of being observed. Of 477 occurrence reports, 433 reported some form of cougar behaviour during the interaction (Fig 15). The most frequently recorded behaviour were predatory attacks (32%, 140 of 433 occurrences).

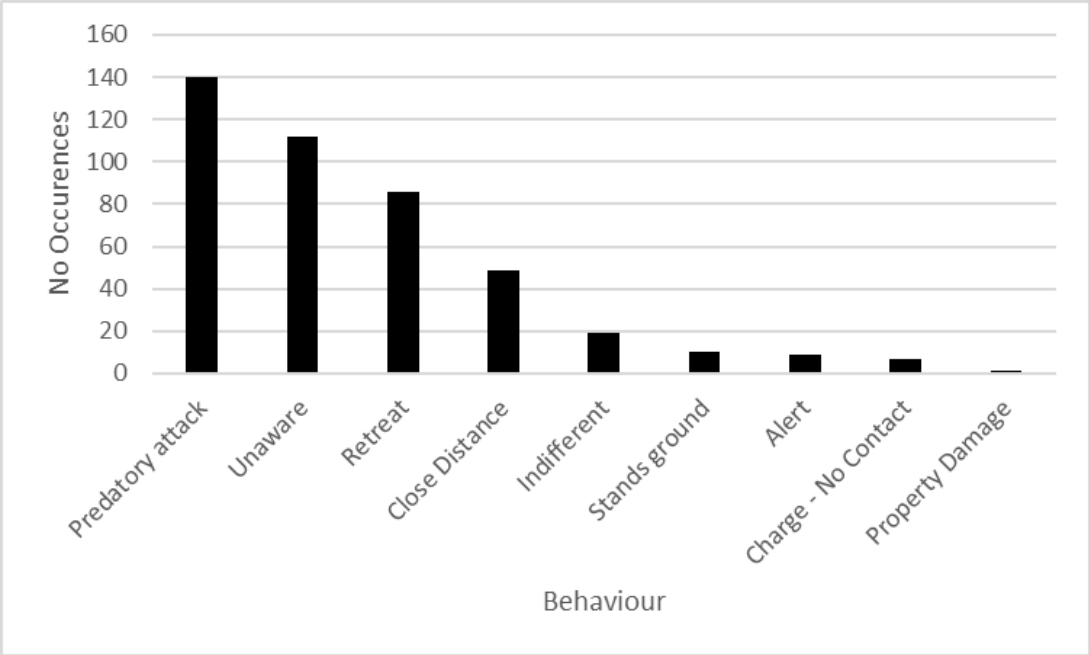

Figure 13. Behaviours observed in Cougars Involved in Human-Cougar Occurrences (N= 433)

Of these predation events, 46% (64 of 140) were on livestock, 31% (43 of 140) on domestic animals, and 23% (32 of 140) on wildlife (including wildlife carcasses) with 1 occurrence of a cougar threatening to attack a hunter. The hunter shot the cougar. Often occurrences took place where the cougar was “Unaware” of its observer such as when an animal was observed from inside a residence, inside a vehicle, from a long distance, or instances of cougar tracks being found on residential properties. These included instances of cougars seen repeatedly walking through residential properties, golf course, or urban green spaces. This type of occurrence was the second most observed (Fig 16).

Retreat behaviour occurred in almost 20% (86 of 433) of the interactions with cougars either fleeing or walking away. Close distance behaviour (11% or 49 of 433) was a concerning behaviour from a public safety perspective. These instance either involved closing distance on a person or it could have involved a domestic pet but regardless, would have elevated the occurrence to a higher level of potential public safety concern. Charge-no contact behaviour (2% or 7 of 433) consisted of cougars chasing wildlife or other animals. When cougars Stood Ground (2% or 10 of 433) there was more aggressive type behaviour such as crouching, hissing or baring teeth exhibited whereas with Alert behaviour animals usually just watched, stared, or sat up). For both these behaviour types cougars neither retreated nor approached.

Mitigation

Education

The primary program related to managing cougar related interactions is currently public education. Alberta Environment and Parks provides educational material that focuses on how to prevent human cougar interactions and what to if you encounter a cougar (https://www.alberta.ca/cougars-and-outdoor-recreation.aspx). In WMU 410, the Bow Valley WildSmart (BVWS) program promotes similar messaging to Bow Valley residents and recreationists. The BVWS speaker series has scheduled cougar biologists to come and speak to residents about these issues during the winter months. These events are usually very well attended.

Informative signs at recreational facilities, pamphlets, and community and school presentations about safely living and recreating in cougar habitat can be useful for conflict-reduction (Sweanor and Logan 2009). Educational signage has been installed in various locations throughout the SSR to further educate the public on cougar prevention (Fig 16).

Figure 14. Cougar signage at Canmore Nordic Centre

Predator Compensation

The provincial predator compensation program compensates livestock producers when livestock are killed or injured by a black bear, grizzly bear, wolf, cougar or eagle. Livestock covered under the program include cattle, sheep. Swine and goats. Horses and exotic animals such as llamas, alpacas and donkeys are not covered under the program.

There have been 99 approved cougar predation claims between 2015 and 2018 (Fig 17). The majority of these occurred in the northern portion of the Region. Sheep (95 % or 94 of 99) were the primary livestock being compensated for followed by cattle (4% or 4 of 99). The total payout to producers was $25,971 during this period.

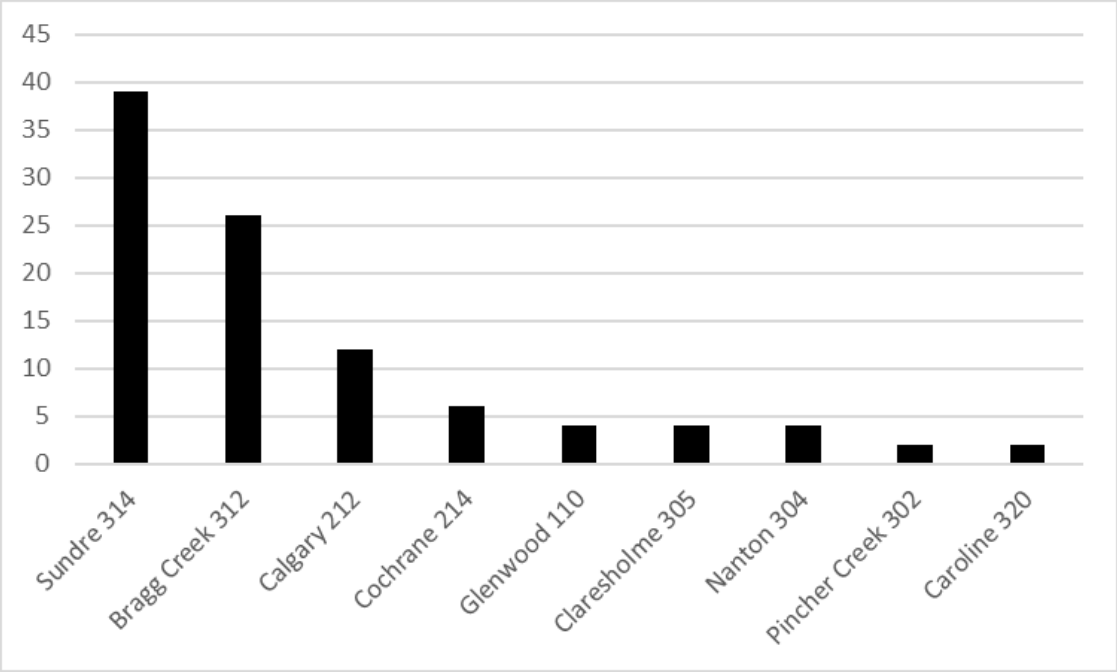

Figure 15. Cougar Predator Compensation by WMU (N= 99)

Provincial Management

The 2012 Cougar Management Plan takes into account the increasing cougar population and expansion beyond traditional cougar range. There are hunting quotas for both male and female cougars for each Cougar Management area in the province. Owners and occupants of private lands can hunt (not trap) cougars without a license. Cougars harvested during fall season and on private lands do not count against quotas.

Management removal of cougars are directed by the provincial Cougar Response Guide (https://open.alberta.ca/publications/97801460127186). Translocation is not considered for cougars involved in public safety incidents in Alberta.

Conclusion

Reducing HCO will hinge on the success of reducing opportunities for cougars and humans to interact. Because cougars and humans are increasingly occupying the same space, conflict management will rely on a cougar-conscious use of the landscape.

References

Beier, P. 1991. Cougar attacks on humans in the United States and Canada. Wildlife Society Bulletin 19:403-412.

Cougar Management Guidelines Working Group. 2005. Cougar management guidelines. WildFutures, Bainbridge Island, Washington.

Government of Alberta – Environment and Sustainable Resource Development. 2012. Management Plan for Cougars in Alberta.

Knopff, A. A. 2011. Conserving cougars in a rural landscape: habitat requirement and local tolerance in west-central Alberta. MSc thesis, University of Alberta, Edmonton, Alberta.

Knopff, K. H. 2010. Cougar predation in a multi-prey system in west-central Alberta. PhD dissertation, University of Alberta, Edmonton, Alberta.

Knopff, K. H., and M. S. Boyce. 2007. Prey specialization by individual cougar (Puma concolor) in multi-prey systems. Pages 194–210 in J. Rham, editor. Transactions of the Seventy-Second North American Wildlife and Natural Resources Conference. Wildlife Management Institute, Washington, D.C., USA.

Logan, K., and L. L. Sweanor. 2009. Behavior and social organization of a solitary carnivore. Pages 105–117 in M. Hornocker and S. Negri, editors. Cougar: ecology and conservation. University of Chicago Press, Chicago, Ilinois USA.

Mattson, D. J. 2007. Managing for human safety in mountain lion range. In Mountain lions of the Flagstaff Uplands, 2003-2006 progress report, Edited by D.J. Mattson. Washington, D.C.: U.S. Department of the Interior, U.S. Geological Survey.

Manfredo, M. J., H. C. Zinn, L. Sikorowski, and J. Jones. 1998. Public acceptance of mountain lion management: a case study of Denver, Colorado, and nearby foothills areas. Wildlife Society Bulletin 26:964-970.

Riley, S. J. and D. J. Decker. 2002. Wildlife stakeholder acceptance capacity for cougars in Montana. Wildlife Society Bulletin, 28: 931-939. Riley, S. J. 1998. Integration of environmental, biological and human dimensions for management of mountain lions. Thesis, Cornell University, Ithaca, New York.

Torres, S. G. 2005. Lion sense: traveling and living safely in mountain lion country. 2nd ed. Falcon Guide, Guilford, USA.

Torres, S.G., T.M. Manfield, J.E. Foley, T. Lupo, A. Brinkhus. 1996. Mountain lion and human activity in California: testing speculations. Wildlife Society Bulletin 24: 451-460

Hunt, C. 1999. “Partners in Life” Program: Bear Shepherding Guidelines for Safe and Effective Treatment of Human – Bear Conflicts. Wind River Bear Institute, Heber City, Utah.

APPENDIX I

Definitions

Location Type:

Frontcountry Trail: Municipal trail or other within developed area

Trail Backcountry: Trail in wilderness setting

Frontcountry Campground: Formal, designated highway (non-ATV) accessed campground.

Backcountry Campground: Formal designated non-highway vehicle (i.e. foot, horse, boat,

ATV) accessed campground.

Campground Random: Informal, non-designated vehicle of no vehicle accessed campground.

Facility/Playground/Playfield: Non-residential type facility (clubhouse, commercial development, recreation centre, school etc.) or playground or sports field.

Golf Course: Formal golf course.

Day Use Area: Designated picnic area or trailhead.

Railway: Railroad

Roadside: Any road used by highway approved vehicle.

Residential Urban: A residence (yard, driveway etc.) located in a high density urban setting

(town, city, village).

Residential Rural: A residence including outbuildings, located in a low density residential areas

(e.g. rural acreage, farm, cabin).

Pasture-(private land): Private lands used for grazing livestock.

Leased land: Crown land under lease used for livestock grazing.

Urban Green Space: Forested patches of green space within municipal areas (e.g. environmental reserve, wildlife corridor, municipal reserve, and park).

Backcountry area: An area away from any human developed footprint e.g. trails, roads, residences, and facilities.

Animal Behaviours:

Alert: Animal acknowledges person's presence by staring, standing up, sniffing air etc. and stops activity it was engaged in prior to person's arrival but does not close distance or retreat.

Close distance: Animal closes distance on person or animal (would include head-on approach or following) but does not make contact.

Predatory Attack: Cougar chases and kills/injures an animal or human.

Charge-no contact: Cougar closes distance aggressively (chases) an animal or person but does not make actually contact the person or animal.

Stands ground: Animal does not retreat or close distance on person but exhibits agitated behaviour (vocalizing, growling, swatting ground).

Indifferent: Animal aware of persons presence but continues activity.

Retreat walk: Animal increases distance from person by walking but does not go into cover.

Retreat run: Animal increases distance from person by running but does not go into cover.

Retreat to Cover walk: Animal increases distance from person by walking and does go into cover.

Retreat to Cover runs: Animal increases distance from person by running and does go into cover.

Retreat: Animal increases distance but no indication provided as to whether it walked, ran, or whether it entered cover or not.

Unaware: Animal is unaware of you

APPENDIX II

Cougar Occurrence Severity Levels and Definitions

No Conflict (such occurrences were not included in this summary report)

Cougar feeding on natural prey (including carcasses) or travelling in non-developed areas (e.g. backcountry areas); or travelling irregularly thru campgrounds (frontcountry, backcountry or random), golf courses and general sightings in the backcountry.

Low

Cougar feeding on wildlife (including carcasses) adjacent to or in unoccupied developed areas (e.g. closed trailheads, campgrounds, picnic areas, day use sites, golf courses); travelling through residential areas (e.g. yards, streets, driveways), repeated sightings on trails, campgrounds, day use sites, golf courses.

Moderate

Cougar feeding on non-natural foods (e.g. garbage) adjacent to or in developed areas; body commitment into/onto manmade structures (decks, dumpsters, pickup beds, corrals), standing ground behaviour.

High

Cougar predating/feeding on wildlife (including carcasses) near or in developed areas (includes designated trails, urban green spaces); predating on domestic animals (livestock, dogs, cats) in non-developed areas (e.g. trails, urban green spaces, backcountry areas, pastures), partial or whole body commitment into 2 or 3 sided structures; closing distance/following behaviours.

Very High

Cougar depredating on domestic animals (livestock, pets) in developed areas; entering 4 sided occupied or unoccupied structures for food or shelter; major property damage; charges people or domestic pets.

Extreme

Cougar injures or kills people.