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# 2022 Winter Cougar Season Quota Updates



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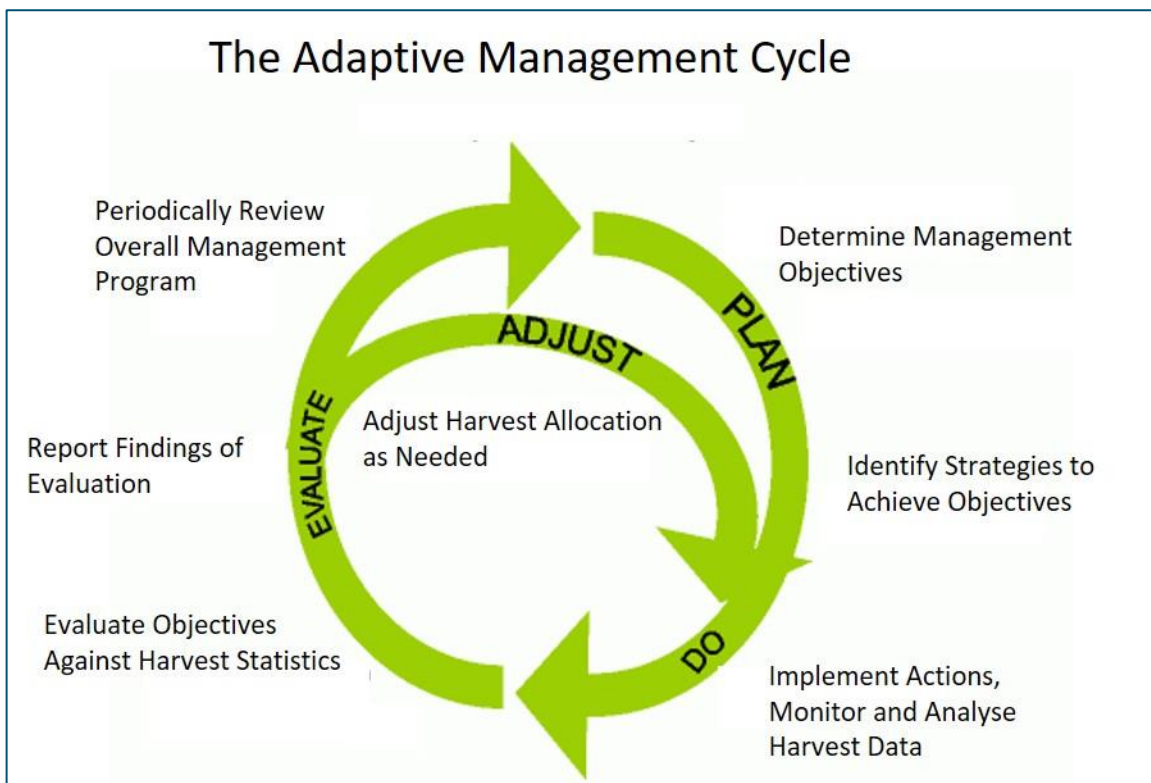


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# Introduction

Fish and Wildlife Stewardship (FWS) manages cougars in Alberta using an adaptive management framework where; management objectives are set, harvest strategies are implemented, harvest results are monitored and compared against management objectives, and adjustments are made when necessary (Figure 1, Walters 1986, Environment and Sustainable Resource Development 2012). In 2019, FWS clarified cougar management objectives that are described in the Management Plan for Cougars in Alberta (Environment and Sustainable Resource Development 2012, Environment and Parks 2019). The refined objectives aim for harvest allocation not to exceed the average annual population growth rate of 14-16 percent of the estimated adult population in a given cougar management area (CMA, Beausoleil et al. 2013, Environment and Parks 2019). The management intent associated with this clarification is to improve the quality of cougar hunting by allowing the population to stabilize at an older age structure. An older age structure of cougars results by removing fewer mature cats, which promotes higher rates of dispersal of young animals, thus stabilizing the local population (Cooley et al. 2009, Meletzke et al. 2014).



**Figure 1.** The adaptive management cycle where objectives are developed, implemented, evaluated, adjusted and reviewed as required.

The closure of the Canada-United States border, resulting from the COVID 19 pandemic, prevented non-resident alien (NRA) hunters from participating in Special License (SL) guided hunts for the entire 2020 and much of 2021 winter cougar seasons. To compensate for the lost revenue of individual outfitters, the Alberta Government allowed that SL guided hunts could, 1) be sold to resident hunters, or 2) be deferred until used or 2027. This management change increased the potential total harvest in some CMAs beyond harvest objectives. However, the actual harvest associated with this change is unknown and as such, will not influence general license quotas for 2022. Still, future adjustments may be required as the harvest is monitored and the adaptive management framework is applied (Figure 1).

This report presents the potential total cougar harvest associated with deferred SL allocations (Table 1) and evaluates the previous 3-years harvest and total human caused mortality against management objectives (Tables 2 and 3).

# Management Framework

The Management Plan for Cougars in Alberta (Environment and Sustainable Resource Development 2012) identifies four main goals:

1. Manage cougars to ensure stable populations,
2. Provide non-consumptive and consumptive recreational opportunities for resident Albertans and non-residents,
3. Minimize property damage and other hazards to humans, and
4. Learn about the cougar population in Alberta and communicate those learnings to the public.

Each of these goals includes a number of objectives that lead to the goal being met. There are two objectives that are relevant to harvest management:

- a) Maintain a viable population of at least 1,500 cougars on provincial lands,
- b) Allow a maximum annual human caused mortality rate of not more than 20 percent of the estimated provincial population.

The province is divided into four zones for the purposes of cougar management; protected, source, stable, and sink. Parks and Wilderness Areas, where hunting is not allowed, make up the protected zone. Source zones provide a buffer from potential population declines in the stable zones. In the stable zones, cougars are managed to maximize harvest and maintaining stable populations. Sink zones are managed to reduce or maintain small cougar populations or to prevent them from establishing.

Additionally, since 2019 Fish and Wildlife Stewardship has been aiming to keep hunting allocation and thus harvest between 14 and 16 percent of the estimated adult population in a given CMA (Environment and Parks 2019, Table 2).

## Potential Special License Harvest

In a typical year, there are 26 Special License (SL) tags issued (Table 1) in addition to quota allocations. Fish and Wildlife Stewardship gives the rights to cougar SL to the Alberta Professional Outfitters Society (APOS), who then auction them off to their members. Once an APOS member purchases rights to a cougar SL, it is theirs until they decide to sell or lease the rights to it. Periodically, cougar SL allocations are reviewed.

Shown in Table 1 is the normal annual SL allocation of 26 tags and, for transparency, the deferred SL allocations available as part of the government's support measures provided to APOS to mitigate impacts of travel restrictions related to COVID-19 on their industry, as well as the total number of SL allocations available for the 2022 season. The increase of SL allocations by a possible 24 additional cougars harvested puts the total potential removals in some CMAs over the target harvest rate. Although 2022 cougar quotas were reduced in a few CMAs, the reduction is not related to the deferred SL allocations (Table 2, discussed below).

## Quota Allocation

### Cougar abundance estimate

Because of their elusive nature and large home-range sizes, estimating the number of cougars on a landscape is challenging (Cougar Management Guidelines Working Group 2005). For these reasons, many jurisdictions follow recommendations to use averaged density estimates multiplied by the area of occupied habitat (Cougar Management Guidelines Working Group 2005, Environment and Sustainable Resource Development 2012, Beausoliel et al. 2013, Environment and Parks 2019). Total and adult cougar abundance estimates were updated for each Alberta CMA in 2019 (Environment and Parks 2019). Density estimates were used to calculate those updates and those estimates have not changed. The methodology and results of these estimates are reported in the 2019 Winter Cougar Season Quota Updates report located on the My Wild Alberta Website and at this link <https://open.alberta.ca/publications/winter-cougar-season-quota-updates>. Because density estimates have not changed, and because FWS manages for stable cougar populations, the most recent abundance estimates were used to calculate sustainable harvest for the 2022 winter cougar season.

## Management objectives

As reported in 2019 (Environment and Parks 2019), the aim is to keep quota harvest around 14 percent while not exceeding 16 percent of the estimated adult population in a given CMA (Beausoleil et al. 2013, Table 2). The intent is to prevent harvest from exceeding the annual population growth rate, in an attempt to stabilize the population at an older age structure, thus producing a higher quality harvest for hunters, while at the same time reducing human-cougar conflicts (Beausoleil et al. 2013, Meletzke et al. 2014, Environment and Parks 2019). The quota allocation exceeds the 14-16 percent threshold in some CMAs that are managed as sinks (Table 2), even though the social stability hypothesis (Beausoleil et al. 2013) suggests that fewer hunter kills results in lower incidents of human-cougar conflicts (Meletzke et al. 2014, Teichman et al. 2016). In CMAs 13-18, quota allocation exceeds 16 percent; however, the 3-year average annual quota removal in those units is less than 16 percent (Table 2). In CMAs where quota allocation exceeds 16 percent of the estimated adult population, the harvest is considered sustainable if total human caused mortality is less than 20 percent of the total cougar population estimate for the CMA (Environment and Sustainable Resource Development 2012, Logan 2019, Table 2).

## Harvest evaluation

The 3-year average quota harvest for all CMAs between 2016 and 2018 was 118.4 cougars per year compared to 85.1 cougars per year for the 2019-2021 3-year period (Table 3). A 3-year average is used because three years is the generation time for cougars. Total quota harvest declined between the two periods (2016-2018 and 2019-2021) by 33.3 cats. Quota harvest remained the same or declined in all but eight CMAs. In those eight CMAs where quota harvest increased, the total adult removal was less than 16% of the estimated adult population (Table 3).

The 3-year average of all human caused mortality (HCM) declined between 2016-2018 and 2019-2021 from 215.3 to 153.7 or 61.6 cats (Table 3). The sustainable removal rate of less than 20% of the total population estimate for a CMA was exceeded in three CMAs (Table 2). Two of the CMAs where thresholds were exceeded (20 and 29) have low numbers of cougars, are managed as population sinks, and have had low average conflict removals over the past 3-years (CMA 20=0.0, CMA 29=0.7), so the quota in those units will not change for the 2022 season (Table 2). The other CMA (7) that exceeded total removal thresholds had quotas exceeding the 14-16 percent adult population target (24.6%) and an average of 7.7 cougars removed due to conflict with humans over the past 3-years. Quotas in CMA 7 have been reduced to equal 14.8 percent of the estimated adult population (Table 2) in an attempt to stabilize the population and reduce the number of cats removed in conflict situations (Robinson et al. 2008, Cooley et al. 2009, Beausoleil et al. 2013, Teichman et al. 2016).

The most recent 3-year average total known cougar mortality provincially (includes cats outside CMAs) is 170.7 cougars per year, which is 10.9 percent of the total estimated population of 1559 cats (Environment and Parks 2019). This removal rate is less than the allowable maximum of 20 percent of the provincial cougar population estimate (Environment and Sustainable Resource Development 2012).

## Quota changes

In addition to the reduction discussed above for CMA 7 (reduced one male and one female), three other CMAs (25, 26, 28) have been reduced by one cat each to move closer to 14-16 percent threshold removal rate of the estimated adult population (Table 2). These four changes reduce the provincial quota by five cougars (two males and three females) from 111 to 106 (Table 2).

# Tables

**TABLE 1.**

Potential Special License Harvest for the 2022 Winter Cougar Season

<b>CMAs</b>	<b>2022 Allocation</b>	<b>2022 Available Deferral*</b>	<b>2022 Potential SL Harvest</b>
1, 2	2	3	5
3	2	2	4
4	1	1	2
5	2	1	3
7	2	1	3
8, 9	1	1	2
8, 13	1	2	3
9, 13	2	3	5
11, 12	3	2	5
15, 16	1	2	3
17, 22	1	0	1
19, 23	1	0	1
21, 24, 25	1	0	1
23, 24	1	1	2
21, 22	1	2	3
27, 28	1	2	3
19, 28	1	1	2
25, 30	1	0	1
29, 31	1	0	1
<b>Total</b>	<b>26</b>	<b>24</b>	<b>50</b>

\*As deferrals are used, the number available will be reduced. Following the 2027 season, all remaining deferrals will expire.



**TABLE 2**

The 2021 and 2022 cougar quotas along with the proportion of the estimated adult population allocated, the potential Special License removal from each cougar management area (CMA) during the 2022 season, the management strategy, along with the 3-year average annual quota harvest (2019-2021) with proportion of estimated adult population and the 3-year average known human cause mortality (HCM) with proportion of the total cougar estimate for each CMA.

CMA	Quota (% Ad)		Potential SL Take 2022	Zone	3-Year Annual Average (2019-2021)	
	2021	2022			Quota Take (%Ad)	All HCM (%Total)
1	3 (28.2)	3 (28.2)	5	Sink	2.0 (18.8)	3.7 (14.7)
2	4 (15.1)	4 (15.1)	5	Stable	4.6 (20.1)	8.0 (14.5)
3	5 (12.7)	5 (12.7)	4	Stable	5.3 (13.6)	11.0 (13.6)
4	4 (15.1)	4 (15.1)	2	Stable	4.0 (15.1)	7.3 (11.8)
5	6 (14.7)	6 (14.7)	3	Stable	4.7 (11.5)	7.7 (8.9)
6	2 (15.7)	2 (15.7)	0	Stable	0.0 (0.0)	1.0 (3.8)
7	5 (24.6)	3 (14.8)	3	Stable	4.3 (21.3)	13.3 (27.8)
8	4 (13.2)	4 (13.2)	5	Stable	2.7 (8.8)	6.7 (12.6)
9	3 (11.9)	3 (11.9)	7	Stable	4.0 (15.9)	5.7 (12.9)
10	3 (12.4)	3 (12.4)	0	Sink	2.7 (11.0)	3.7 (11.1)
11	4 (13.3)	4 (13.3)	5	Stable	5.7 (18.9)	8.0 (11.8)
12	7 (13.2)	7 (13.2)	5	Stable	5.3 (10.0)	6.3 (5.2)
13	3 (16.5)	3 (16.5)	8	Source	2.7 (14.6)	3.3 (10.1)
14	3 (22.0)	3 (22.0)	0	Source	0.7 (4.9)	1.3 (7.0)
15	3 (18.8)	3 (18.8)	1	Source	1.0 (6.3)	2.0 (6.1)
16	4 (16.3)	4 (16.3)	3	Source	1.0 (4.1)	1.0 (1.9)
17	3 (19.8)	3 (19.8)	1	Stable	1.7 (11.0)	3.3 (10.4)
18	3 (22.2)	3 (22.2)	0	Source	0.7 (4.9)	1.3 (4.8)
19	2 (11.5)	2 (11.5)	3	Stable	1.3 (7.6)	2.3 (6.5)
20	2 (46.8)	2 (46.8)	0	Sink	1.7 (39.0)	3.0 (33.3)
21	5 (12.9)	5 (12.9)	4	Stable	7.3 (19.0)	12.7 (15.3)
22	4 (14.0)	4 (14.0)	4	Stable	4.0 (14.0)	7.7 (12.8)
23	5 (12.9)	5 (12.9)	3	Stable	5.0 (12.9)	9.0 (11.1)
24	3 (15.7)	3 (15.7)	3	Stable	2.7 (13.9)	4.7 (11.7)
25	3 (29.5)	2 (19.7)	2	Stable	1.7 (17.3)	3.3 (16.7)
26	4 (66.3)	3 (49.7)	0	Sink	0.3 (5.5)	0.3 (2.6)
27	2 (23.0)	2 (23.0)	3	Stable	1.3 (15.3)	2.0 (11.1)
28	4 (25.5)	3 (19.2)	5	Sink	2.3 (14.9)	3.0 (9.1)
29	2 (44.1)	2 (44.1)	1	Sink	2.0 (44.1)	5.3 (59.3)
30	2 (38.5)	2 (38.5)	1	Stable	1.0 (19.3)	2.0 (18.2)
31	2 (22.5)	2 (22.5)	1	Stable	1.0 (11.2)	2.7 (14.0)
32	2 (13.7)	2 (13.7)	0	Stable	0.3 (2.3)	1.3 (4.3)



Outside CMAs	0 (0.0)	0 (0.0)	NA	NA	0.0 (0.0)	17.0
<b>Total</b>	<b>111</b>	<b>106</b>	<b>50*</b>	<b>NA</b>	<b>85.1</b>	<b>170.7</b>

\*Many SLs are usable in multiple CMAs. The total potential harvest by SL for the 2022-2023 winter season is 50 (Table 1).

**TABLE 3**

3-year average quota harvest and known human caused mortality (HCM) with proportion of the adult and total population respectively, for the periods 2016-2018 and 2019-2021.

CMA	3-Year Ave. Quota Take (% Ad)		3-Year Ave. HCM (% Total)	
	2016-2018	2019-2021	2016-2018	2019-2021
1	3.3 (31.3)	2.0 (18.8)	5.3 (21.3)	3.7 (14.7)
2	5.7 (21.4)	4.7 (17.6)	10.3 (18.8)	8.0 (14.5)
3	7.0 (17.8)	5.3 (13.6)	13.7 (16.9)	11.0 (13.6)
4	5.7 (21.4)	4.0 (15.1)	11.7 (18.8)	7.3 (11.8)
5	3.7 (9.0)	4.7 (11.5)	7.3 (8.7)	7.7 (8.9)
6	0.3 (2.6)	0.0 (0.0)	1.0 (3.8)	1.0 (3.8)
7	6.7 (32.8)	4.3 (21.3)	15.0 (31.3)	13.3 (27.8)
8	7.3 (24.3)	2.7 (8.8)	11.3 (21.4)	6.7 (12.6)
9	9.3 (37.1)	4.0 (15.9)	11.3 (25.8)	5.7 (12.9)
10	8.7 (35.9)	2.7 (11.0)	13.3 (40.4)	3.7 (11.1)
11	7.7 (25.5)	5.7 (18.9)	12.3 (18.1)	8.0 (11.8)
12	5.7 (10.7)	5.3 (10.0)	8.0 (6.6)	6.3 (5.2)
13	4.3 (23.8)	2.7 (14.6)	6.0 (18.2)	3.3 (10.1)
14	1.0 (7.3)	0.7 (4.9)	1.3 (7.0)	1.3 (7.0)
15	1.3 (8.4)	1.0 (6.3)	2.7 (8.1)	2.0 (6.1)
16	0.7 (2.7)	1.0 (4.1)	0.7 (1.3)	1.0 (1.9)
17	1.3 (8.8)	1.7 (11.0)	5.3 (16.7)	3.3 (10.4)
18	0.3 (2.5)	0.7 (4.9)	2.0 (7.1)	1.3 (4.8)
19	1.7 (9.6)	1.3 (7.6)	3.7 (10.2)	2.3 (6.5)
20	4.0 (93.7)	1.7 (39.0)	4.7 (51.9)	3.0 (33.3)
21	10.3 (26.47)	7.3 (19.0)	23.3 (28.1)	12.7 (15.3)
22	4.0 (14.0)	4.0 (14.0)	8.3 (13.9)	7.7 (12.8)
23	6.0 (15.5)	5.0 (12.9)	12.7 (15.6)	9.0 (11.1)
24	2.7 (13.9)	2.7 (13.9)	5.3 (13.3)	4.7 (11.7)
25	2.0 (20.8)	1.7 (17.3)	4.3 (21.7)	3.3 (16.7)
26	0.7 (11.0)	0.3 (5.5)	1.0 (7.7)	0.3 (2.6)
27	1.0 (5.6)	1.3 (7.4)	1.7 (9.3)	2.0 (11.1)
28	1.0 (6.4)	2.3 (14.9)	1.7 (5.1)	3.0 (9.1)
29	3.7 (80.8)	2.0 (44.1)	5.7 (63.0)	5.3 (59.3)
30	1.3 (25.7)	1.0 (19.3)	2.7 (24.2)	2.0 (18.2)
31	0.0 (0.0)	1.0 (11.2)	1.0 (5.3)	2.7 (14.0)
32	0.0 (0.0)	0.3 (2.3)	0.7 (2.2)	1.3 (4.3)
<b>Total</b>	<b>118.4</b>	<b>85.1</b>	<b>215.3</b>	<b>153.7</b>

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