

M220 information from Yellowstone Cougar Project, Yellowstone Center for Resources, YNP
Dan Stahler, Project Leader , dan_stahler@nps.gov, 307/344-2719 (o)

Adult male cougar M220 was part of a study on cougar population dynamics, predation patterns, and multi-species interactions for the National Park Service's Yellowstone Cougar Project. He was first captured and collared on December 11, 2019 east of Hellroaring Creek on Garnet Hill in YNP. At the time of capture, he was aged as a 3 1/2 year old male based on top canine gum recession measurements and weighed 130 pounds. He was fit with a GPS collar that was programmed to take location data ever 3 hours (except during predation season in winter where it was hourly). Over the first year of movements after he was collared late 2019, his territory was largely within the park. He was documented associating with at least two different GPS collared adult female cougars inside YNP, suggesting he was a breeding male inside the park during 2020. Genetic studies are still pending to determine M220's breeding contribution to the population and where he originated from (i.e. from within YNP or outside). Often it is the case that young males like M220 emigrate into a local population from outside to become breeders, thereby avoiding inbreeding with related females in the area from which they are born. During 2021, M220 began moving north of the park more consistently, perhaps in response to conflict with other territorial males inside YNP, or through natural territorial extension to find more breeding opportunities. Throughout 2021, he would make movements north of YNP as far as southwestern end of Paradise Valley and began spending considerably more time outside YNP in the latter half of 2021. He would still travel south into YNP even in the week before his death. These movement patterns suggest M220 had expanded his territory to include both inside and outside of YNP.

It was reported to Dan Stahler (YNP) by a local who heard that a radio-collared male cougar was injured in the Tom Miner Basin area by a hunter around Dec 12th, 2021. Cougar M220's locations were confirmed in Tom Minor Basin on that date. It was not known or confirmed the extent of his injuries from the report, and M220's points were monitored for the following two weeks from satellite uploads. He spent some days in the same location in Tom Minor, but eventually began traveling again, indicating he had survived what may have been only a minor injury. Between December 13, 2021 and the day of his death, he traveled south toward YNP and looped into the park, but returned north to southeast portion of Paradise Valley. He was killed by a hunter in Rock Creek on public land on December 28th, 2021. The hunter that killed M220 is not believed to be the same hunter that injured him a couple weeks earlier.

M220 provided valuable data for the two years he was monitored. The Yellowstone Cougar Project conducted several predation sequences on M220 while he was collared to inform on seasonal kill rates and prey selection by cougars in the Yellowstone region. This work involved searching GPS clustered points over 30-45 consecutive days during early winter (Nov-Dec), late winter (Feb-March), and summer (May - July) to determine presence of a kill, prey species, age, sex, condition, and other information. Data from this work showed M220 largely preyed upon elk and mule deer throughout these focal predation periods. Some of this work and mention of M220's predation patterns were discussed in an interview with Dan Stahler on the MeatEater Podcast, "The Hunting Collective" (Episode 135, July 21, 2020). As an identifiable collared individual, M220 also routinely triggered remote cameras inside YNP providing detection data used in a mark-recapture camera trap study to estimate Yellowstone's cougar population. M220 contributed data on predation, habitat selection, interaction with other species, cause-specific mortality, survival, and source-sink dynamics in the Greater Yellowstone Ecosystem. This data will be used to help inform managers and educate stakeholders about cougars living in the Greater Yellowstone Ecosystem.

COUGAR MORTALITY FORM

path: O:\admin\data_forms\wolf mortality form.doc
updated: 1/6/2016

Data entered (initials)
into database: _____

Cougar No.: M220 Collared?: Yes No If Yes, Freq. #: 32666

Sex: Male Female Unknown

Age Class: kitten yearling subadult adult unknown Age in Years: 5.5

Date of Birth: Summer 2010 est YN

Date Last Alive: 12/28/21 Date of First Mort Signal: 1/1/21 n/a

Date of Death (DOD): 12/28/21 DOD Estimated?: Yes No

Time of Death (if known): Between 12 noon - 3pm Date of Field Exam: 1/1/21

General Location of Death: Rock Creek

UTM Easting: 504469 UTM Northing: 5007583 NAD 83 estimated from GPS data but not certain.

Cause of Death: Interspecific Disease Malnutrition Mange

Intraspecific: What pack killed wolf? Def _____ Prob _____ Poss _____ Unk _____

Natural-Other (specify): _____ Natural-Unknown Unknown

Vehicle Illegal Control Action Harvest Human-Other (specify): _____

Scavengers: Present? Yes No Unknown

Grizzly Bear # _____ Black Bear # _____ Coyote # _____ Fox # _____ Mtn Lion # _____
Raven # _____ Magpie # _____ Bald Eagle # _____ Golden Eagle # _____ Eagle Unk # _____
Wolf # _____ Pack: _____ Other(specify): _____ # _____

Carcass:

Utilization (circle one): 0-25% utilized 26-50% 51-75% 76-100%

Bones found: ALL BONES OR Skull Pelvis Mandibles Scapulae Femur
Tibia Metatarsus Humerus Radius & Ulna
Metacarpus Vertebra out of 30

Samples Collected: none skull tissue hair scat whisker(s)

post-cranial (specify): _____

femur: %fat content: _____ (after drying)

disease swabs: _____

other (collect and note any abnormalities—e.g. arthritis, abscessed tooth, etc): _____

Skull & post-cranial only: How many bags are in freezer? (Try to fit in one bag) _____

Legally harvested by a MT hunter* in Rock Creek on public land who was with a local handsman.

MORPHOMETRICS / MEASUREMENTS

Specify units (i.e., - cm preferred, but note if inches), and specify which side (right or left) of wolf is being measured.

General body condition (circle): poor fair good very good excellent

Mange?: Yes No Unk (If yes, please fill out mange data form for more detail)

Old injuries? Yes No (describe in comments)

Weight ~ 150 lbs _____ kgs On Kill: yes no unk

Body Length _____ cm Tail Length _____ cm Total Length _____ cm

Front foot length _____ cm Front foot width _____ cm Foot Measured: left right

Neck girth _____ cm Shoulder height¹ _____ cm Chest Girth _____ cm

Pelt color/Other significant markings _____

none available except heard from Warden [redacted] he was around 150 lbs

- heard there was a cow elk carcass.

TEETH General condition (note broken or chipped teeth, staining, and wear):

Canines: UL _____ mm UR _____ mm LL _____ mm LR _____ mm

Circle Any Broken Canines: UL UR LL LR NONE UNK

Incisor Wear (circle): None Light Moderate Severe

Upper Carnassial Wear (circle): None Capped Cusps Pitted Cusps Pitted Cusps + Valleys Heavy Wear

All Dentition Wear (circle): None Light Moderate Severe

Other dentition wear + staining: _____ Deciduous teeth present?: Yes No

Results of physical exam of the animal - attach lab reports as necessary (e.g., punctures, lacerations, blood, exam of wolf—including old injuries, etc.), results of exam of site where animal died (include evidence of struggle, disturbed veg., tracks, etc), and scavenger/carcass utilization:

Nothing available. Warden [redacted] gave us collar after 1 hunter checked M220 in.

A Report from two weeks earlier indicated that another hands man [redacted] had pursued M220 in Tom Miner and a hunter shot and wounded him.

First reported to me by [redacted] M220 travelled big loop back south into park and back north to Rock Creek. Not clear how badly wounded he had been.

Examined by:

MT FWP Game Warden

(Use first & last names)

¹Measure shoulder height from top of scapula to leading edge of middle toe pad with leg straight.

Range of Body Measurements for Females: 112-145 cm body length, 38-57 cm tail length, 157-196 cm total body length, 8-13 cm foot length, 6-9.5 cm foot width, 39-51 cm neck girth, 61-85 cm shoulder height, 66-84 cm chest girth

Range of Body Measurement for Males: 95-151 cm body length, 41-60 cm tail length, 164-206 cm total body length, 8-14 cm foot length, 6.5-10 cm foot width, 42-62 cm neck girth, 65-92 cm shoulder height, 69-92 cm chest girth

CollarID	LMT_Date	LMT_Time	Easting	Northing	Latitude [°]	Longitude [°]	DOP
32666	12/28/2021	3:01:07 PM	12508756.73	5008756.637	45.2322466	-110.888444	2
32666	12/28/2021	12:01:07 PM	12504467.98	5007580.647	45.2217012	-110.9430908	3.8
32666	12/28/2021	9:00:39 AM	12504821.86	5007443.008	45.2204599	-110.9385848	3.2
32666	12/28/2021	6:00:40 AM	12504824.74	5007440.551	45.2204377	-110.9385481	4.6
32666	12/28/2021	3:00:39 AM	12504885.57	5007523.412	45.2211832	-110.9377726	2.6
32666	12/28/2021	12:00:39 AM	12504821.95	5007435.565	45.2203929	-110.9385837	7.2
32666	12/27/2021	9:01:08 PM	12506358.78	5004744.541	45.1961572	-110.9190438	2.8
32666	12/27/2021	6:00:39 PM	12508162.11	5002479.234	45.1757472	-110.8961219	3.6
32666	12/27/2021	3:01:39 PM	12508130.25	5002288.311	45.1740289	-110.8965305	2.8
32666	12/27/2021	12:00:39 PM	12508126.3	5002284.309	45.1739929	-110.8965808	2.8
32666	12/27/2021	9:01:09 AM	12508062.9	5002292.15	45.1740643	-110.8973877	7.6
32666	12/27/2021	6:02:06 AM	12507191.15	5004297.396	45.1921242	-110.908453	2.6
32666	12/27/2021	3:01:36 AM	12507186.99	5004306.62	45.1922072	-110.9085058	4.4
32666	12/27/2021	12:00:37 AM	12507184.5	5004307.732	45.1922173	-110.9085376	2.6
32666	12/26/2021	9:00:37 PM	12507188.15	5004307.044	45.192211	-110.9084911	2.6
32666	12/26/2021	6:00:37 PM	12507086.17	5003275.027	45.1829222	-110.9098041	5.4
32666	12/26/2021	3:01:07 PM	12507087.01	5003275.69	45.1829282	-110.9097932	4
32666	12/26/2021	12:00:39 PM	12507085.01	5003278.83	45.1829565	-110.9098187	4.4
32666	12/26/2021	9:01:32 AM	12507238.15	5003597.393	45.1858225	-110.9078648	3.4
32666	12/26/2021	6:00:45 AM	12507184.63	5004311.831	45.1922542	-110.9085358	2.6
32666	12/26/2021	3:01:32 AM	12507183.29	5004309.845	45.1922363	-110.9085529	4.6
32666	12/26/2021	12:00:39 AM	12507193.54	5004299.948	45.1921471	-110.9084226	2.8
32666	12/25/2021	9:01:40 PM	31166021.45	0			0
32666	12/25/2021	6:00:40 PM	12507190.67	5004307.356	45.1922138	-110.9084589	4
32666	12/25/2021	3:00:39 PM	12507184.27	5003046.555	45.1808646	-110.9085587	2.8
32666	12/25/2021	12:00:39 PM	12507181.91	5003044.722	45.1808482	-110.9085887	4.8
32666	12/25/2021	9:00:39 AM	12507107.12	5003634.356	45.1861566	-110.9095322	2.6
32666	12/25/2021	6:00:37 AM	12507201.13	5004311.009	45.1922466	-110.9083258	2.6
32666	12/25/2021	3:01:38 AM	31166021.45	0			0
32666	12/25/2021	12:00:37 AM	12507183.42	5004309.014	45.1922288	-110.9085512	2.6
32666	12/24/2021	9:00:37 PM	12507189.35	5004279.562	45.1919636	-110.9084762	3
32666	12/24/2021	6:00:37 PM	12510387.14	5002389.137	45.1749069	-110.8678063	1.8
32666	12/24/2021	3:01:08 PM	12511222.67	5002185.991	45.1730654	-110.8571773	3.4
32666	12/24/2021	12:01:53 PM	12511201.71	5002195.451	45.1731509	-110.8574439	5
32666	12/24/2021	9:01:39 AM	31166021.45	0			0
32666	12/24/2021	6:00:41 AM	12511202.29	5002194.805	45.1731451	-110.8574366	6
32666	12/24/2021	3:00:39 AM	12511779.69	5002041.13	45.1717524	-110.850092	2.2
32666	12/24/2021	12:00:39 AM	12513740.13	5000987.025	45.1622283	-110.8251727	3

12/28/2021

Carbella

M220 adult male cougar

Locations between Dec 20, 2019 and Dec 28, 2021

Corwin Springs

Aldridge

Jardine

Gardiner

Google Earth

10 mi

