

Adaptive Elk and Carnivore Management Project Update

September 09, 2024

Background:

The purpose of this five-year project is to assess how habitat treatments, carnivores, and other factors impact elk population vital rates and distributions and use this information to develop recommendations for meeting elk population objectives in NW Montana. We are also developing camera-based methods to estimate elk and carnivore abundance in hunting district (HD) 121, which will be compared to aerial surveys and then applied to other hunting districts where aerial surveys are not possible due to heavy tree cover. Our goals in this second year of the project are to continue collecting baseline data on elk vital rates, distributions, and habitat conditions, and maintain a grid of cameras. HD 121 was selected as the study area in part due to the abundance of elk and feasibility of capture, as well as the ongoing and potential forest management activities occurring in this area. Elk harvest has declined in HD 121, raising concerns from FWP and stakeholders regarding this elk population. FWP is partnering with the University of Montana to complete this project.

Spring and Summer 2024 Update:

Elk collaring and monitoring

During spring 2024, we captured **66** neonate elk (27 females and 39 males) in the HD 121 study area. To identify birth events, we monitored adult female collar data and alerts from vaginal implant transmitters. We then used ground and helicopter crews to locate, capture, and GPS-collar the neonates.

Since December 2022, we have captured a total of **212** individual elk and GPS-collared **101** adults, **20** 6-month-old calves, and **91** neonatal calves. We are currently monitoring **92** adult elk (**86** females and **6** males) and **46** calf elk (**18** calf females and **28** calf males). We have recorded a total of **8** collar malfunctions, **37** mortalities, and **21** slipped calf collars (i.e., expandable neonate collars that appear to have slipped over the animal's head with no evidence of a mortality), and **8** scheduled drop-offs of collars for 6-month-old elk (i.e., collars deployed in winter 2022-23 and programmed to drop off after one year of deployment). To date, we have collected a total of **428,101** elk locations (Figures 1 & 2).

Carnivore collaring and monitoring

Since late spring 2024, we have had crews out to trap black bears using culvert traps. This effort is ongoing through to the end of summer. To date, we have captured and collared a total of **7 black bears** (**1** females and **6** males). Of these, we have recorded **0** collar malfunctions and **2** mortalities. We have collected a total of **4,155** black bear locations to date.

To date, we have captured and collared a total of **9 mountain lions** (**7** females and **2** males). Of these, we have recorded **0** collar malfunctions and **1** mortality. We have collected a total of **11,884** lion locations to date.

Additionally, FWP staff captured and GPS-collared **2 wolves**. Of these, we have recorded one mortality.

Camera deployment

During May-Jun 2023, we deployed 80 random cameras and 39 predator cameras paired with the random cameras across HD 121 for the purpose of estimating elk, mountain lion, wolf, and black bear abundance. We serviced (replaced batteries and SD cards) all 119 cameras Sep-Oct 2023 and again May-Jun 2024. From the first servicing (2023), cameras collected 10,083 elk photos (95 timelapse captures), 2,894 black bear photos (24 timelapse captures), 26 mountain lion photos (0 timelapse captures), and 14 wolf photos (0 timelapse captures). Elk were detected on 55% of the cameras, black bears were detected on 59% of the cameras, mountain lions were detected on 3% of the cameras, and wolves were only detected on 1 camera. Other species detected included mule deer, white-tailed deer, moose, grizzly bear, coyote, red fox, bobcat, American badger, northern raccoon, striped skunk, short/long-tailed weasel, pine marten, rabbit/hare, squirrel, mice, and chipmunk.

The image classification process is currently in progress for the second servicing (2024). We are currently using photo data from summer 2023 to estimate abundance of elk, mountain lions, black bears, and wolves in HD 121.

Vegetation surveys

We measured vegetation and collected biomass samples at 222 sites from May-Aug 2023 and 223 sites from May-Aug 2024 for the purpose of characterizing the summer nutritional landscape for elk across HD 121. To estimate elk forage species,

we collected 14 weekly composite fecal samples (i.e., pellets from 3-5 different sites each week) during May-Aug 2023, 6 during winter 2022-23, and 20 during May-Aug 2024. To estimate forage quality (i.e., digestible energy), we have collected 369 samples of elk forage species across both summers. Work is ongoing to estimate forage biomass and digestible energy (kcal/g) at each sampling site which will then be used to predict elk forage quantity and quality across the landscape.

Upcoming field work

During Sep-Oct, we will service (replace batteries and SD cards) all cameras. During Dec-Mar, we will capture and collar adult elk using clover traps (all winter) and by helicopter (over a few days). This will be our final winter capture operations.

Table 1: Mortality summary arranged by species and mortality date

Species	AnimalID	Sex	CaptureAgeClass	CaptureDate	MortDate	MortAgeClass	MortCause	MortConfidence
Bear	NOXB2301	Male	Adult	2023-06-11	2024-05-12	Adult	Hunter harvest	Certain
Bear	NOXB2302	Male	Adult	2023-07-06	2024-08-05	Adult	Unknown	NA
Elk	NOX23020	Female	6-mo calf	2023-02-07	2023-02-10	Calf	Natural	Probable
Elk	NOXN23019	Male	Neonatal calf	2023-06-05	2023-06-07	Calf	Predation - lion	Certain
Elk	NOXN23015	Male	Neonatal calf	2023-06-03	2023-07-08	Calf	Natural	Certain
Elk	NOXN23017	Male	Neonatal calf	2023-06-03	2023-07-15	Calf	Predation - bear	Probable
Elk	NOX23057	Male	6-mo calf	2023-02-14	2023-08-08	Adult	Predation - wolf	Certain
Elk	NOX23039	Male	Adult	2023-02-16	2023-09-04	Adult	Hunter harvest	Certain
Elk	NOX23047	Female	Adult	2023-01-25	2023-09-06	Adult	Hunter harvest	Certain
Elk	NOXN23021	Female	Neonatal calf	2023-06-05	2023-09-19	Calf	Predation - lion	Certain
Elk	NOX23040	Male	Adult	2023-02-14	2023-09-28	Adult	Hunter harvest	Certain
Elk	NOX23006	Female	Adult	2023-02-21	2023-10-06	Adult	Natural	Probable
Elk	NOX23030	Male	Adult	2023-02-15	2023-10-12	Adult	Harvest-related	Certain
Elk	NOXN23009	Male	Neonatal calf	2023-06-02	2023-10-15	Calf	Harvest-related	Certain
Elk	NOX23003	Female	Adult	2023-02-16	2023-11-01	Adult	Hunter harvest	Certain
Elk	NOX23027	Female	Adult	2023-02-15	2023-11-08	Adult	Hunter harvest	Certain
Elk	NOX23026	Female	Adult	2023-02-16	2023-11-14	Adult	Predation - lion	Probable
Elk	NOX23109	Female	Adult	2023-02-16	2024-01-27	Adult	Predation - wolf	Certain
Elk	NOX24009	Male	6-mo calf	2024-01-04	2024-02-25	Calf	Predation - lion	Certain
Elk	NOX24052	Female	6-mo calf	2024-01-18	2024-03-14	Calf	Natural	Probable
Elk	NOXN24000	Male	Neonatal calf	2024-05-20	2024-05-27	Calf	Other	Certain
Elk	NOXN24030	Female	Neonatal calf	2024-05-31	2024-06-03	Calf	Other	Certain
Elk	NOX24006	Female	6-mo calf	2024-01-05	2024-06-06	Adult	Natural	Certain
Elk	NOXN24025	Male	Neonatal calf	2024-05-30	2024-06-06	Calf	Predation - bear	Certain
Elk	NOXN24019	Female	Neonatal calf	2024-05-28	2024-06-07	Calf	Predation - bear	Certain
Elk	NOX23022	Female	Adult	2023-01-07	2024-06-08	Adult	Predation - lion	Probable
Elk	NOXN24031	Male	Neonatal calf	2024-05-31	2024-06-10	Calf	Predation - bear	Certain
Elk	NOXN24052	Male	Neonatal calf	2024-06-06	2024-06-10	Calf	Other	Certain
Elk	NOXN24051	Male	Neonatal calf	2024-06-05	2024-06-17	Calf	Predation - bear	Certain
Elk	NOXN24039	Female	Neonatal calf	2024-06-01	2024-06-18	Calf	Predation - lion	Certain
Elk	NOXN24015	Male	Neonatal calf	2024-05-28	2024-06-22	Calf	Predation - lion	Certain
Elk	NOXN24022	Male	Neonatal calf	2024-05-29	2024-06-26	Calf	Predation - lion	Certain
Elk	NOXN24065	Male	Neonatal calf	2024-06-20	2024-07-01	Calf	Predation - lion	Certain
Elk	NOX23014	Female	Adult	2023-02-15	2024-07-02	Adult	Natural	Certain
Elk	NOXN24043	Female	Neonatal calf	2024-06-02	2024-07-11	Calf	Predation - lion	Certain
Elk	NOXN24001	Female	Neonatal calf	2024-05-21	2024-08-02	Calf	Predation - bear	Probable
Elk	NOX23111	Female	Adult	2023-02-16	2024-08-08	Adult	Natural	Certain
Elk	NOXN24047	Male	Neonatal calf	2024-06-03	2024-08-19	Calf	Natural	Certain
Elk	NOXN24006	Female	Neonatal calf	2024-05-24	2024-08-30	Calf	Predation - bear	Probable
Lion	NOXL2301	Female	Adult	2023-01-06	2024-01-24	Adult	Starvation - injury	Certain

Adult female elk movements

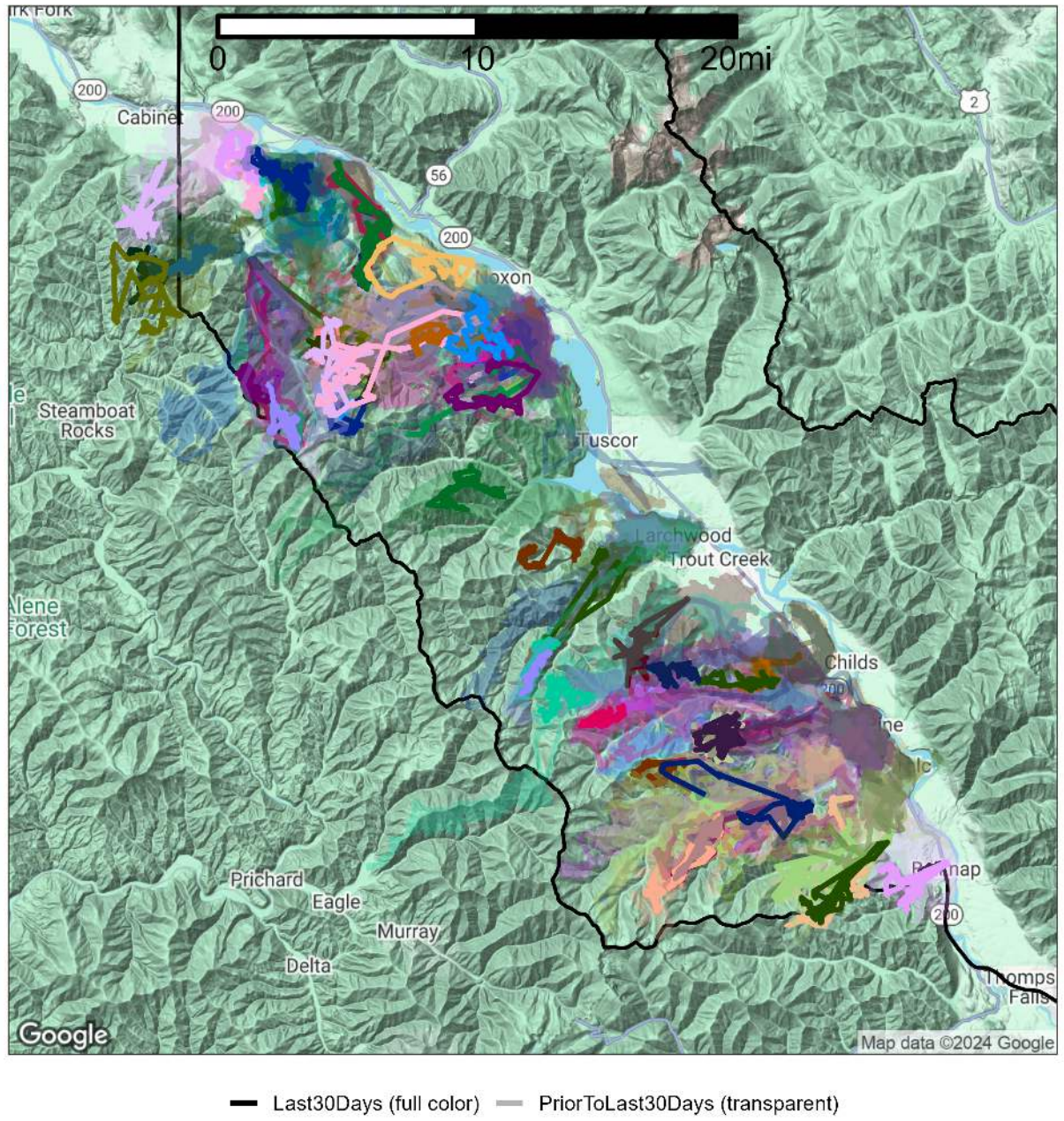


Figure 1: Map of adult female elk movements with movement paths colored by individual. The HD121 boundary is outlined in black.

Adult male elk movements

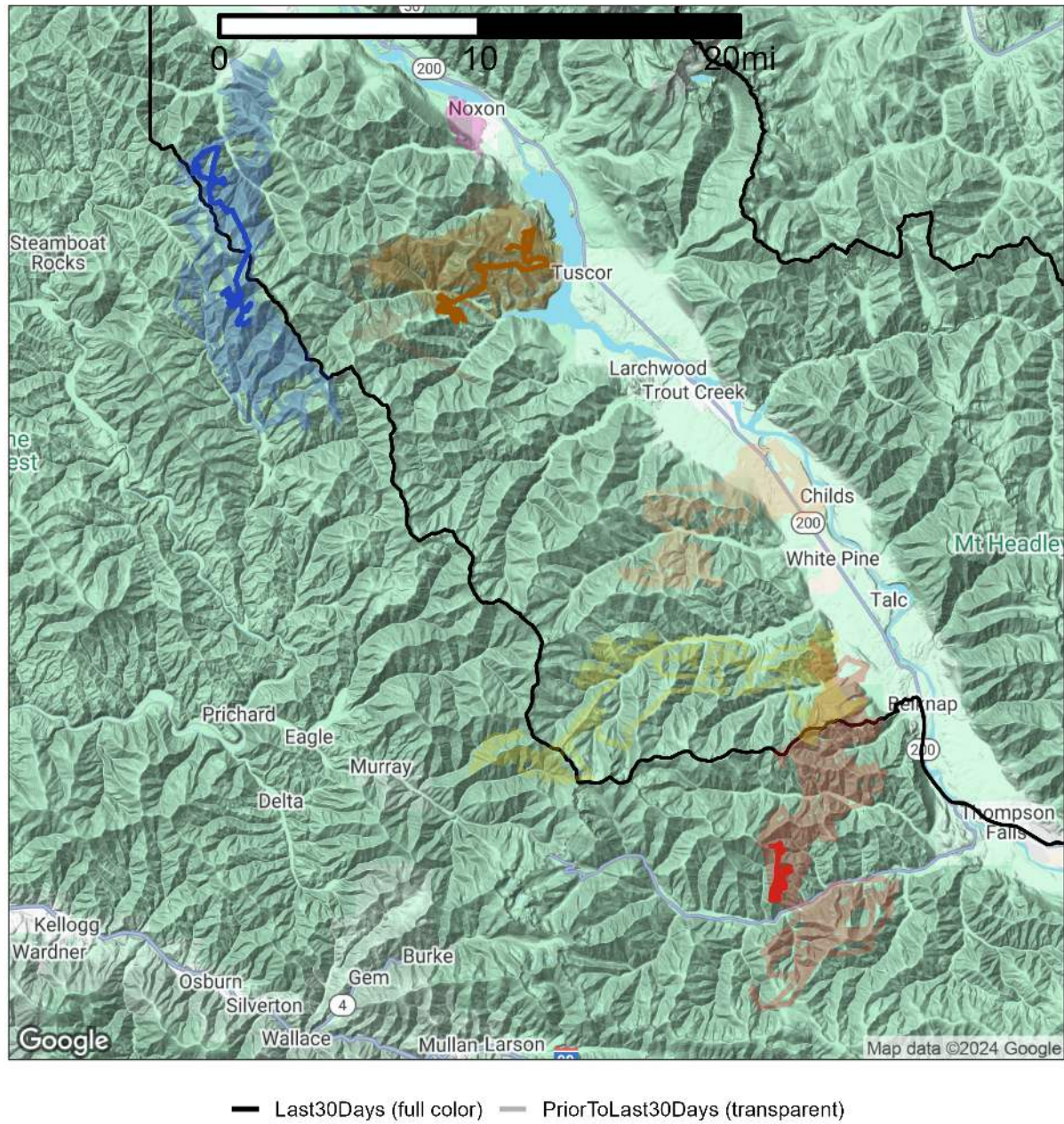


Figure 2: Map of adult male elk movements to date with movement paths colored by individual. The HD121 boundary is outlined in black.