CASCADE CITIZENS WILDLIFE MONITORING PROJECT
WINTER 2007-2008 FIELD SEASON REPORT

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ABSTRACT

The winter program of the Cascade Citizen Wildlife Monitoring Project (CCWMP, formerly Cascade Wildlife Monitoring Project) uses trained volunteers to record the presence and movement of wildlife, through snow tracking surveys and remote camera instillations, in the vicinity of proposed wildlife crossing structures along Interstate-90 in the Washington Cascades between Snoqualmie Pass and Easton. The second field season of the project continued to meet the projects several goals including: training volunteers in wildlife tracking and road ecology, and adding a second season of data on wildlife along Interstate 90. Data collected from this year mirrors findings from the previous season fairly closely. Exceptionally heavy snowfall in the middle of the field season significantly hampered data collection efforts, however a larger number of volunteers resulted in an increased number of transects completed compared to the prior season. Use of handheld computers for data collection was piloted successfully. Remote Cameras were added to the winter efforts with limited success. Recommendations for next season include: continue implementation of data collection through snow tracking; focus programmatic use of remote cameras during the non-snow seasons to complement winter data and reserve use of cameras to respond to specific sightings in the field; make minor revisions to hand-held computer system to further streamline data collection and management.

PROJECT OVERVIEW AND SUMMARY OF FIELD SEASON

CCWMP is a joint project of Wilderness Awareness School (WAS), an environmental education organization, I-90 Wildlife Bridges Coalition (a campaign that fiscally sponsors the program), and Conservation Northwest (CN), a conservation organization. CCWMP uses trained volunteers to monitor the location and movement of wildlife in the vicinity of proposed wildlife crossing sites along Interstate-90 in the Washington Cascades between Snoqualmie Pass and Easton. This report documents the winter field work for 2007-2008. A full report for all of the projects activities for the year will be available in late 2008 (including spring-fall remote camera data from Interstate 90 and the rest of the Cascades) A complete description of the projects goals and methods is available online at:
http://www.i90wildlifebridges.org/monitoring.htm
http://www.i90wildlifebridges.org/CWMP%202006-2007%20Final%20Report.pdf.

Winter 2007-2008 Summary

The winter of 2007-2008 was the second field season for CCWMP. Minor protocol changes were implemented and significant changes to data recording methods where piloted, using handheld computers with integrated GPS units. Set up and management of remote cameras along transects was also piloted with minimal success.

This season's transect trip reports reveal three issues that help describe this season: weather, equipment, and transect identification.

Weather: This season's weather was a major challenge. Of the 33 trips that were scheduled (this includes reschedules), only 19 were completed (of these one had no recordable species). Some of these were missing one side of the highway or one section of a side due to weather conditions or weather-related late starts. Unusual amounts of precipitation, avalanches and avalanche danger, pass closures, and parking lot closures keep teams from carrying out transects. In addition, more teams this year reported low quality tracking conditions than reported them last year which impacted the quantity of data collected.

Team leaders rightly prioritized safety in many instances. However, looking at actual experiences on the ground, a lesson may have been learned about not predicting tracking conditions from Internet weather and pass reports. Very few transects that were canceled on their original date were successfully rescheduled. In future seasons, team leaders are encouraged to carry out transects even if the weather conditions predict low quality tracking unless they are confident they will be able to successfully reschedule.

Equipment: This season the project initiated a transition from paper recording of transect data to electronic recording. Difficulties were expected and encountered with the software and equipment itself as well as human error in operating it. Trip reports mention problems with CyberTracker at least 8 times, but the majority of trips were accurately recorded. While some team leaders want more familiarity with Cyber Tracker, by and large, the transition is made.

Camera work was a new addition to team responsibilities this year, and many team leaders struggled with locations, batteries, cards, and uploading. Many also enjoyed the experience and teams often felt the cameras were interesting additions to their work. Some leaders feel camera work may have cut into available time to trail common species.

Transect locations: A high percentage of trip reports indicate that flagging was not visible in some locations for most or part of the transects. The bulk of these reports come after the large snowfalls and after the peak of trip cancellations. We can assume that flagging was buried under snow. Some teams felt confident enough about the routes to re-flag and others did not.

Spring, Summer, and Fall Data Collection:

During the spring and summer of 2007, several team leaders performed trial surveys along our winter transects, collecting data following our snow season protocol. Each transect was inventoried once in the spring and the summer. These efforts yielded interesting and important findings (see discussion bellow) but also clearly demonstrated that significant modifications to the protocol would need to be made to ensure consistent data collection between individual data collectors. Because of this and the desire to shift the use of remote cameras to the non-snow seasons of the year, the project will not be implementing tracking transects during the non-snow season (except as noted in discussion bellow), instead focusing on set up and maintenance of remote cameras both along the interstate and in core habitat areas in the adjacent mountains.

METHODOLOGY CHANGES

Cybertracker Technology

At the beginning of this year's field season the project implemented the use of a more efficient method of collecting data using hand held computers with integrated global positioning systems in the field. The Software being used is called "Cybertracker," (www.cybertracker.co.za). It is used internationally, completely free, and can be used on Palm Pilots, Pocket PC handheld computers, and Smart Phones with GPS. To make this possible, we purchased four Mio P550 Pocket PCs with GPS. Within the Cybertracker program, a sequence of screens was created specifically to collect data for the CCWMP protocol. All of the information that was previously recorded on the paper data sheets in the field is now entered directly into this sequence of screens on the Mio for later downloading to the project database.

The Cybertracker sequence allows the user to tap on various check boxes and scroll down menus, and to enter in data with a stylus, while the screens prompt along the way to make sure they aren't forgetting anything. In this way, team leaders and volunteers can easily carry a Mio into the field and collect data without having to juggle clipboards, paper, pencils, and a separate GPS. Each Mio is outfitted with a clear waterproof bag, so that rain and snow cannot affect them. When the team leaders return from the field to enter their findings into the database, all they have to do is "ActiveSync" the PocketPC to the computer via a cable, and press a button, rather than having to manually enter in all of the data. Using this method reduces errors, and makes it easier to collect and enter the data.

During this field season we continued using the paper data sheets as a backup along with the Cybertracker software, in case any problems arose. Our goal is to phase out the paper data sheets altogether, so that next season, Cybertracker can be used as our sole data collection method.

Altogether, the use of Cybertracker as a data collection method seemed to go smoothly during this year's season. Trainings were held in the Fall of 2007 for teamleaders and volunteers to familiarize themselves with the Pocket PCs and Cybertracker, and there were very few complaints during the field season. Only one problem arose with the program, which was quickly resolved. The major set-back seemed to be participants' lack of rigor about keeping the units charged and ready to go. More feedback will be sought from team leaders as to how we can make the 2008/09 field season go more smoothly.

Remote Cameras:

The project had a total of four (4) Moultrie Game Cameras (model: Digital Game Camera 200) placed in the field from December 8, 2007 (Price Noble South-East & South-West were placed first during team leader training) until the last camera was pulled from the field on April 13, 2008 (Price Noble South-West).

As this was the first year of integrating cameras into the tracking protocol, some complications were expected. The objective of this pilot year was to test whether there

was a value in combining the two efforts (tracking and cameras) that previously had been conducted almost simultaneously by different teams in nearly identical locations during the winter months. From the onset, the lack of clearly defined goals and expectations for the new process produced some problems with coordination between camera and tracking trainings – and to some degree this lack of clarity also affected the field season as well. Additionally, the system for storing camera accessories (extra batteries and memory cards) also created problems for volunteers attempting to service cameras. Finally, due to rapidly changing field conditions like those experienced this past winter, we realized that more frequent checks and servicing of cameras is needed in order to have the greatest chance of producing photos of wildlife in the field.

For these and other reasons stated elsewhere in this report (including the need to maximize time spent tracking during the short daylight hours in winter), the project has decided not to integrate tracking transects with cameras in the 2008-2009 winter season. Instead, the plan will be to utilize the remote cameras during winter months separate from our tracking efforts - primarily to respond to credible rare species sightings in the field that may come to our attention. We hope to better utilize our agency partners and volunteers during this next winter season to strategically locate remote cameras to follow-up on those sightings.

Should this comprehensive approach of combining tracking and cameras be attempted again in the future, better integration with tracking and camera trainings, and an easier method for accessing materials for servicing a camera site (such as fully charged batteries), etc. is highly recommended.

DATA

Methods:

Excluding records where behavioral observations associated with track and sign were considered reliably indicative of species (e.g. aquatic mustelids entering and exiting waterways and displaying sliding behavior), all observations associated with poor track quality (*Snow Track Quality* equal to 1) were not considered reliable and thus are not included among the data presented. Similarly treated were observations where species was recorded as ambiguous or unknown. Of such observations, the majority were associated poor snow track quality, as might be expected. While it is tempting to conduct statistical comparisons to 2007 results, the outcomes of such analyses would be largely meaningless given insufficient number of sampling periods (n=2).

Data:

2008 species detections of note include *Puma concolor*, at Price-Noble Creek and Easton Hill on consecutive days (continuity suggest a single animal roughly following the Interstate-90/Yakima River corridor), *Martes americana* at Hyak, *Lynx rufus*, and *Canis latrans*. *Lynx rufus* and *Canis latrans* comprised approximately 75% of all reliable detections, and were found at all highway transect sites (Figure 1). *Canis latrans* was detected at all sites, including the lower elevations of the Hyak site, except Easton Hill, and behind *L. rufus*, was the most frequently detected species. In keeping with the previous year's data, *Martes americana* was detected with regularity at the highest elevation portions of the Hyak/Silver Fir site. Given the small location of detections, it is

likely that these records represent a single individual. The species was not detected at any of the highway sites. 2008 represented the second year in which we found evidence of two species, *Procyon lotor* and *Lutra candensis*, predicted by habitat to be marginal or absent within the study area (Table 1).

As in 2007, *Erethizon dorsatum* was predicted but not found. Evidence of this species has been discovered by the project manager and several team leaders in the vicinity of the Price-Noble North transect (both north and south of the interstate) during visits unrelated to carrying out a complete inventory of a transect (a skull, and crevice in a cliff with large quantities of scat and quills). Additionally, unlike 2007 efforts, surveys failed to record *Castor canadensis* or *Mustela vison.* The reasons for these failures are unclear, and may or may not be linked to greater snow level. Several team leaders noted fresh sign of *Castor canadensis* in the vicinity of the Gold Creek and Price-Noble East transects during visits unrelated to surveys.

The paired transect sites of Price-Noble Creek (proposed site of Rock-Knob crossing) were found to have a much greater detection rate than any other sites (Figure 1). It is important to note that detection rates are best regarded primarily as an indicator of presence, and secondarily as an index of usage intensity. They are not an index of population size, nor of density. Of animals trailed at highway sites (*Lynx rufus, Canis latrans, Puma concolor*), many clearly moved parallel to the highway for distances of 100 yards or more. *P. concolor* trailing failed to determine a relationship to the road.

Species	Detected 2007	Detected 2008	Washington GAP Status/Notes
Beaver	x		present
Black Bear	x	x	present/seasonal
Bobcat	x	x	present
Cougar	x	x	present
Coyote	x	x	present
Elk	x	x	present
Fisher			extinct
Hoary Marmot			marginal/seasonal
Marten	x	x	present
Mink	x		present
Mountain Goat			marginal
Mule Deer	x	x	present
Porcupine			present
Raccoon	x	x	marginal/absent
Red Fox			rare
River Otter	x	x	marginal
Wolverine			extremely rare

Table 1. Expected and detected species. Expected species list based on 1997 Washington GAP Analysis (Johnson and Cassidy, 1997)

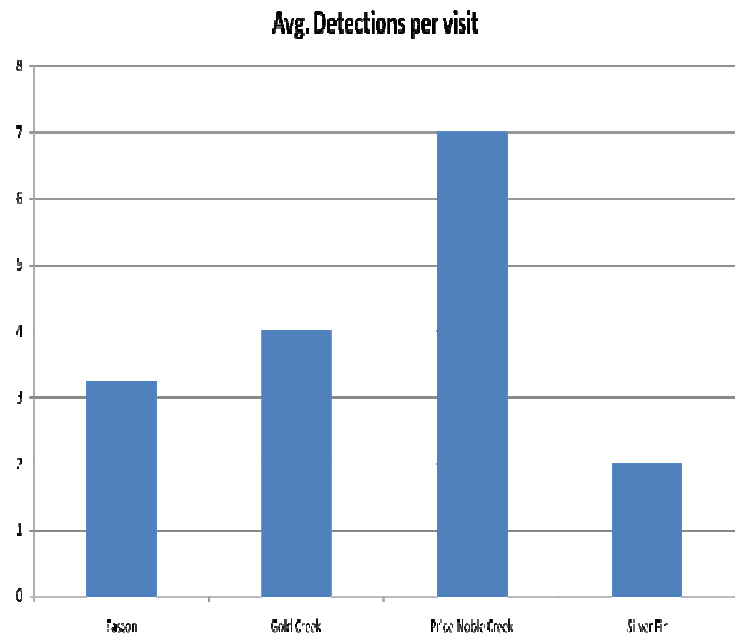

Figure 1. Species of interest rate of detection by location (detections/visit)

Non-snow season tracking efforts:

Transects where inventoried in the spring and summer. The Hyack transect was essentially impassible in parts due to extensive undergrowth, and the majority of the Gold Creek transect was flooded for several months due to impounded water in the Kacheelus reservoir.

Odocoileus hemionus, *Cervus elaphus*, and *Ursus americanus* where detected at every transect location with the exception of Gold Creek where black bear was not detected. These three species are either inactive or have migrated out of the study area for the most part during the winter, when snow tracking surveys are carried out. *Odocoileus hemionus* and *Cervus elaphus* sign was so abundant that it was impossible to quantify effectively using our snow tracking protocols. Feeding sign (rotten logs ripped open in search of insects) of *Ursus americanus* was detected on the Easton south transect, between the east bound and west bound lanes of the Interstate. Extensive use of the west end of this transect was also noted for *Cervus elaphus*, including beds and feeding sign. This would appear to indicate that this area is both currently accessible to both species as well as used for more than just travel from one side of the interstate to the other.

Remote Cameras

The following table summarizes the locations for the cameras, approximate start and end dates in the field, and what pictures were retrieved, if any. If nothing else, it was demonstrated that with light to moderate maintenance of cameras, it is possible to keep several cameras up and running, and despite heavy snows this past winter, get clear images in some locations. Batteries seemed to hold up fine in the cold as there were no reports of finding dead batteries in an instillation when serviced.

Location	Dates in Service	Pictures Retrieved
Price Noble East - South	12/8/2007--3/16/2008	*Canis latrans* (2/24/08)
Price Noble East - North	12/31/2007--3/22/2008	none
Price Noble West - South	12/8/2007--4/13/2008	*Canis latrans* (1/17/08)
Easton Hill - North	1/19/2008--3/?/2008	none

Table 2. Summary of camera locations and photos taken.

Volunteer Effort:

Total number of volunteers and total volunteer hours both slightly increased from the previous season. The ratio of volunteer hours to paid hours also increased. Nineteen transects were completed, 2 more then in the project's pilot season, due to increased number of teams and despite exceptionally difficult weather conditions during much of the month of February. As in the previous year, volunteers participated in every aspect of the project from planning to implementation. The ratio of volunteer to paid hours for this project was over 10 to 1 for the season.

Activity	# of People	Hours
Project Leadership Team (volunteer)	4	589
Training and Transects (volunteer)	56	1492
Project manager (paid)	1	196

Table 3. Summary of volunteer and paid hours for the project. Transect hours based on an average field day including travel to and from study area.

DISCUSSION

Data:

We consider the almost one-to-one correspondence between expected and detected large mammal species, as well as the detection of species predicted by GAP Analysis as absent or marginal, to be indicative of sound methodology in regards to ability to construct an accurate, representative presence-absence database.

Non-snow season data collection:

As late as early June 2007, the entire south side and over half of the north side of the Gold Creek transect was entirely flooded by the water impounded in the Keechelus reservoir, making the transect impossible to survey completely. This of course also makes the area a dubious location for terrestrial wildlife to cross the interstate during the spring and early summer, a time of year when many species make some of their largest movements, either migrating to higher elevations for the summer (as in deer and elk, both of which where detected in the non flooded sections of the northern transect), or in associating with breeding behavior. Lake levels were high but not exceptionally so for

this time of year (U.S. Army Corps of Engineers, 2008), and this will likely be a significant impediment to the effectiveness of these underpasses during the spring and early summer. On July15, the south side of the transect was partly passable and *Odocoileus hemionus* were reported on this side of the interstate.

This transect was specifically located to traverse an area targeted for significant improvements to road permeability in the form of underpasses along the Gold Creek stream corridor. Snow transects over the past two seasons have shown the lowest terrestrial mammal species diversity of any of the highway transects as well as the lowest rate of detections per visit of any of the highway sites. On the south side of the highway, the only fully terrestrial species detected was coyote, possibly due to the fact that there is no cover of any sort along the entire length of the transect nor in its immediate vicinity. This information, coupled with the lack of suitable habitat for terrestrial species during the spring and early summer indicates that the late summer and fall may be the time of most intensive use by terrestrial species in this location. Because of this and the fact substrate for tracking is excellent at this time at this location, performing non-snow tracking surveys of this transect in the late summer and fall might yield interesting information about wildlife use along this critical area.

The documentation of abundant deer and elk sign at every transect and black bear at all but one location during pilot non-snow tracking transects indicates that snow tracking efforts alone will not give a realistic assessment of these species use of the study area over the course of an entire year.

Finding and identifying the tracks and signs of wildlife in non-snow conditions in the study area is much more difficult and complex than in the snow. Our pilot efforts indicated that skill and experience of the data collector would likely significantly impact the type and quality of data that was collected in these conditions. A specific non-snow tracking training and protocol would need to be developed in order to make these efforts consistent and reliable. This fact, along with the decision to focus volunteer efforts during the non-snow season to placement and servicing of remote cameras, has lead to the decision not to implement large scale volunteer tracking transects during the spring, summer and fall at this time.

Remote Cameras:

Only one animal, a coyote (*Canis latrans*), was photographed during the season (see photo in appendix I). The minimal effectiveness of cameras was likely due to extremely variable field conditions which included long periods of fresh snowfall which both buried the cameras and limited the ability of teams to access and modify the camera set ups. Cameras were set up in likely travel locations for wildlife but no attractants were used as cameras where set up close to the interstate. Remote cameras will not be used during the next winter field season.

The fact that no lures where used at any of these camera sights likely contributed to the paucity of photographs. A comparison with the number and rate of wildlife photo events from camera placement not on the highway that were baited with attractants might show

Citizen Science:

The use of a leadership team composed of 4 volunteers and a single paid staff member has proven to be both efficient and highly effective at meeting the project's

goals. Using the field team structure of highly trained team leaders working with several entry level volunteers, the project has continued to maintain a high degree of quality in data collection while also providing excellent educational experiences.

CHANGES FOR NEXT SEASON

Remote Cameras and Trailing:

During the next winter season, teams will not set up and monitor remote cameras. Effort will be redirected for increasing the number of animals that are trailed towards the highway to increase the amount of data collected on interactions between animals and the interstate. Starting in the spring of 2008, volunteer effort will switch from tracking to remote cameras for the non-snow seasons.

Data collection and management:

Starting in the winter of 2008-2009 the project will switch to collection of data with handheld computers completely. Pairs of team leaders will be entrusted with the field equipment they need for the season in order to increase their familiarity with equipment and improve the efficiency of logistics for the project.

Survey Gold Creek transect in fall during low lake levels:

The Gold Creek transect falls along an area targeted for substantial improvements for terrestrial wildlife passage under the Interstate. However winter transects have shown there to be only two completely terrestrial species (*Canis latrans* and *Lynx rufus*) using the area in the winter. In the spring and early summer, the entire south side and the majority of the north side is flooded and totally unusable for terrestrial species. Because a number of species of interest (*Cervus elaphus, Odocoileus hemionus, Ursus americanus,* and *Puma concolor*) are more likely to be using this part of the study area in the non-snow seasons this would leave only the late summer and fall as times when these species would actually use crossing structures in this location.

The substrate on the transect to the south is excellent (exposed lake sediment) for tracking. Significant sections of similar substrate exist on the northern transect route as well. These conditions are very different then at any of the other transect locations and carrying out tracking surveys of these locations would likely be quite successful at detecting use of these and other species during the late summer and fall. Attempts will be made to carry out surveys of this location several times between late July and late October.

Initiate a greater amount of photo documentation:

Attempts will be made to collect more photographic specimens of tracks and signs found during snow transects to be used as training resources, and educational and outreach material for the public at large for the project.

Acknowledgements:

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Sources:

Johnson, RE, KM Cassidy. 1997. Mammals of Washington State: Location data and modeled distributions. Washington Cooperative Fish and Wildlife Research Unit, Seattle, WA.

US Army Corps of Engineers, Northwestern Division, Water Management Division. Available from: http://www.nwd-wc.usace.army.mil/perl/dataquery.pl?k=id:KEE File: Dataquery: Keechelus Dam & Lake On Yakima River Near Martin. [2008 April 29]

Appendix A: Photographs from field season

photo 1. *Canis latrans*. Price-Noble West Transect (north side of Interstate)

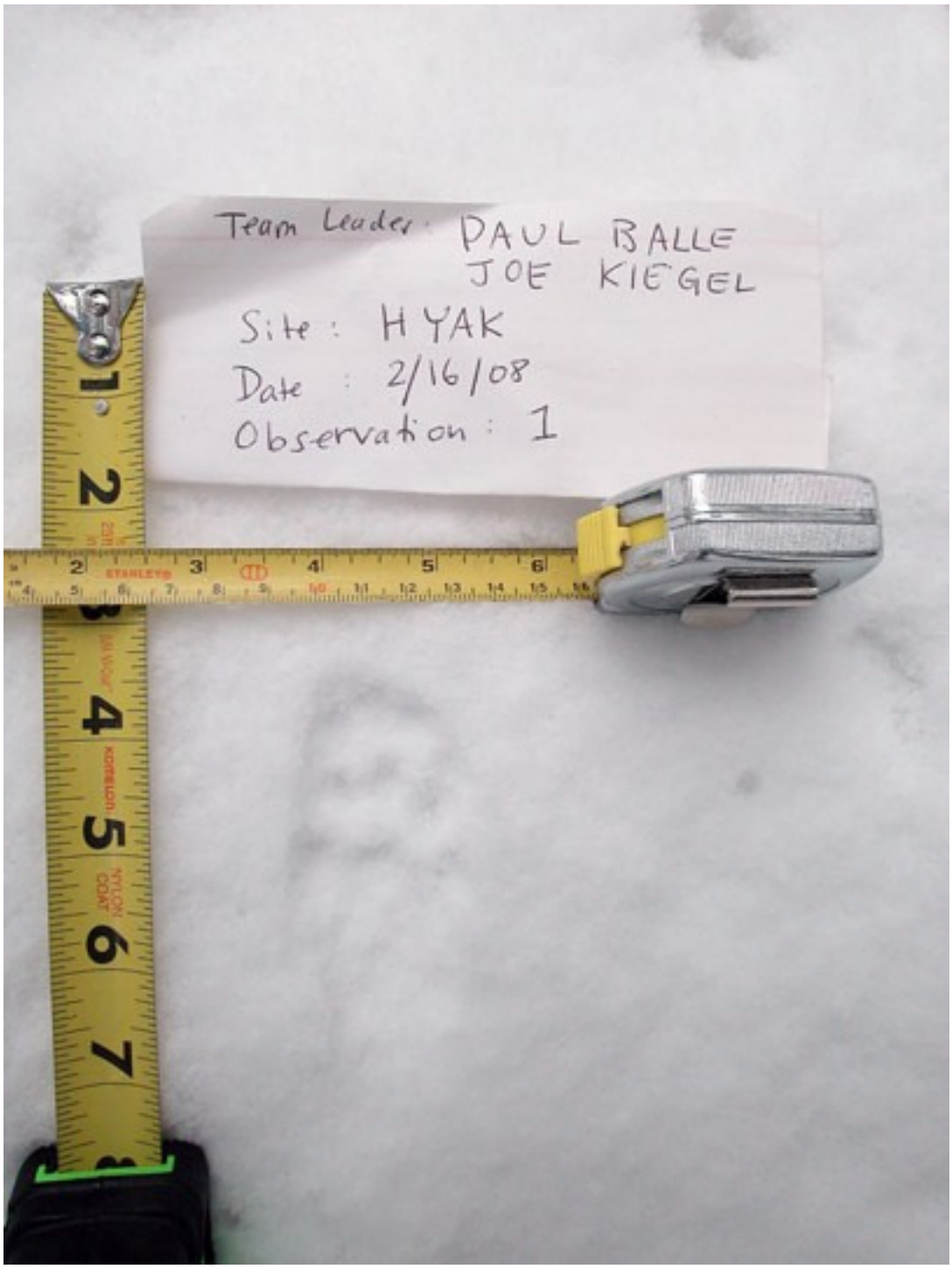

photo 2. *Martes Americana*. Hyak transect. (photo by Amy Gulick)

photo 3. *Martes Americana*. Hyak transect. (photo by Amy Gulick)