INTERAGENCY MULTI-SPECIES FOREST CARNIVORE SURVEYS

Winter 2013

OVERVIEW

The US Forest Service (Lolo NF) and MT Fish, Wildlife, and Parks (Region 2) have been working for several years to better integrate surveys for rare carnivores in western MT. The Lolo NF began implementing passive hair snare surveys for fisher in 2007 and 2008. In 2009, FWP joined in, and efforts were focused on fisher and the utilization of passive hair snare surveys (Schwartz 2007). In 2010, we increased effort and implemented a second protocol that allowed us to survey for multiple species by conducting snowtrack surveys in association with the fisher hair snare effort. Efforts continued in 2011 implementing both fisher snares and track surveys, and additional partners (MT Dept. Natural Resources and Conservation, Great Burn Study Group, Northwest Connections) joined in, surveying additional areas and/or providing financial support. In 2013, efforts will include the Flathead National Forest and Montana Fish, Wildlife and Parks' Region 1.

Goals for 2013 are to continue to conduct snowtrack surveys, but to switch from the fisher-specific hair snares to a more generalized bait station to collect hair snares from multiple carnivore species. In particular, the Forest Service will be focusing efforts in the Southwest Crown of the Continent area (roughly the Swan, Seeley, and Lincoln Ranger Districts of the Flathead, Lolo, and Helena National Forests). The Flathead National Forest will also be conducting surveys on the Tally Lake, Glacier View, Spotted Bear, and Hungry Horse Ranger Districts. Northwest Connections has partnered with the USFS to assist in surveying this area.

We plan to utilize protocols for snowtracking developed by researchers at the Rocky Mountain Research Station (Squires 2002; Squires et al. 2004; McKelvey et al. 2006; Ulizio et al. 2006). These methods will allow us to quantify effort across the landscape within a pixilated grid. We will follow backtracks of lynx, wolverine and fisher to collect genetic material for analysis. Details of these protocols and their application in this project are listed below.

We will also be using a method developed by Michael Lucid of Idaho Dept. of Fish and Game to survey for forest carnivores using bait stations. This methodology uses a bait pole (i.e. a tree with bait attached 6' up and gun brushes under the bait to collect hairs of any carnivores that climb the tree to get the bait). Based on information from Lucid et al., lynx may be more hesitant to climb the tree than other species, and thus we will modify the methodology to include the use of lynx hair pads, similar to the National Lynx Survey Protocol (McKelvey et al. 1999).

OBJECTIVES

To implement and refine a multi-species survey at a landscape level. In doing so we will accomplish the following:

- Develop a better understanding of the distribution of rare carnivores across the project area
- Collect genetic material from the 3 focal species which will establish important baseline information (individual ID & sex, sub population genetics, etc)and add to the existing body of knowledge on these 3 species in Montana
- Better understanding of travel routes and coarse habitat selection for these species
- Identify "hot spots" where more intensive research could be conducted (i.e. GPS collar deployment)
- Complement ongoing research and monitoring efforts including reporting on wolf pack activity and lynx habitat mapping efforts
- Raise community awareness/increase support among partners and the general public for forest carnivore conservation
- Make a concerted effort to survey roadless and wilderness efforts that have received very little survey effort to date

PROJECT AREA

Surveys will be conducted on parts of the Lolo, Flathead, and Helena National Forests. Snowtracking surveys will be conducted primarily in areas where agencies have upcoming forest management projects, particularly in portions of project areas where lynx, wolverine, or fisher habitat models suggest potential habitat exists, or where biologists have received recent reports or historic reports of species occurrence. Surveys will also occur in areas where agencies or NGO partners currently conduct track surveys (i.e. along FWP's furbearer survey routes and around Northwest Connections' established track transects). Multi-species bait stations will also be deployed in areas with upcoming forest management planned. Bait stations will also be deployed in grids where fisher and wolverine have been positively identified using hair snares in 2007-2012, as well as in adjacent grids and in areas where lynx, fisher, or wolverine presence has been suggested by incidental sighting, fur harvest records, or track reports. Survey effort is being coordinated by a collaborative group, consisting of biologists on the Lolo, Flathead, and Helena National Forests, as well as Northwest Connections, a non-profit organization in the Swan Valley and in coordination and cooperation with Montana FWP.

FIELD METHODS

Snow Track Surveys:

The purpose of conducting snow track surveys is to document coarse-scale distribution and occurrence of forest carnivores across the study area, particularly the three focal species (lynx, fisher, wolverine). The methods are based on methods developed by John Squires of the Rocky Mountain Research Station to detect forest carnivores across a large landscape (Squires 2002, Squires et al. 2004). The point is to cover a lot of ground as efficiently as possible, in a manner that allows us to determine if rare forest carnivores are present (or not detected) in the area.

- Sampling units are the 5x5 mile grids created by Schwartz et al. (2006) for fisher snare surveys. (5 x 5 mile is roughly 8x8 km, the size of grid used by Squires (2002) and Squires et al. (2004) to emulate a female lynx's home range.) A shapefile of the grid can be downloaded at www.fs.fed.us/rm/wildlife/genetics/fishersurvey.htm
- For Forest Service folks, field maps showing the location of grids across the forest and Southwest Crown, as well as detailed maps of each grid, are located in: T:\FS\NFS\Lolo\Program\2600Wildlife\GIS\WildlifeData\WinterCarnivoreSurveys\Field Maps
- Each grid should be surveyed twice in a winter, at least 2 weeks apart.
- Ideally, surveys should be conducted when snow conditions are most ideal for tracking—generally 3-7 days after a snowfall—in order to have the highest practicable probability of detection (Squires et al. 2006). However, Mother Nature doesn't always cooperate with us, so we often have to conduct surveys in sub-optimal conditions. The datasheet has space for describing tracking conditions, both at a general level (i.e. for the day's tracking route), as well as for individual track observations
- Technicians will search for tracks by traveling approximately 15-20 km/hr using snowmobiles to travel on existing roads and trails within the grid, or by skiing or snowshoeing along trails. Select travel routes that bisect the best habitat (e.g. concentrate your efforts in forested areas, as opposed to recent burns or heavily logged areas). Also choose routes away from roads or trails heavily used by the public and from residences. It may be helpful before entering a new area to look at aerial photos of the area and/or lynx habitat models to determine where to target survey efforts. Avoid snowmobiling routes not open to public snowmobile use, if possible.
- Within a grid, survey at least 10 km (6.2 miles) of road/trail (Squires 2002, Squires et al. 2004). Technicians may work together in tandem, or may separate to cover different roads/trails within a grid, provided that a radio check-in schedule and other safety measures are taken.

- Document track locations of lynx, wolverine, fisher, mountain lion, pine marten, snowshoe hare, and wolf[1] observed on the survey, whether or not the animal entered the road or right-of-way. When a track is encountered, take a waypoint using a hand-held GPS unit[2], and record information about the track onto the datasheet, including
    - Track condition
    - Best guess of species
    - How reliable you think your species identification is
    - Whether or not you backtrack to get genetics samples
- For suspected fisher, wolverine, or lynx tracks, take at least one digital photograph of the track. Include in the photo a ruler for scale, as well as a piece of paper with a label that corresponds with the Track ID number (see datasheet for details on labeling Track IDs).
- DATA RECORDING:
    - For each survey route, you need to fill out a track survey datasheet ("Field Form For Carnivore Track Surveys.docx"). This sheet contains space to record general information about the survey route, as well as to record individual tracks that you observe along the route.
    - Use a field map to trace the route you survey. Attach (staple) this field map to your datasheet and store both in the data folder.
    - Enter data from the datasheet into database "CarnivoreTrackSurveys.xlsx". Note that there are multiple tabs in this database—info from the top part of your field form will go in the Survey Route tab, and then info on track observations from the bottom and back of your field form will go in the Track Observations tab. Directions are included on the Excel sheets.
    - Track routes need to be digitized using ArcGIS, with the track ID included (that corresponds with the track ID from above). See Appendix A below for instructions, and let Carly know if you need additional help.
- Opportunistic track observations (those seen in route to/from a grid, or when out working on fisher snares) should be recorded for lynx, wolverine, or fisher! Fill out a field form, and put "n/a" in fields that don't apply (such as Survey Route ID)

Backtracking:

The purpose of backtracking is to obtain genetic samples from putative lynx, wolverine, or fisher tracks that can be used to provide unequivocal evidence of the species' presence. Genetic information may

[1] For wolf tracks, only record the first observation of tracks in a grid, unless you suspect another set of tracks are from a different group (i.e. if you find a single wolf track early in your survey, and then as you go a few miles farther you encounter a group of 4 wolves, record the group as a second observation).
[2] If possible, record locations using UTM NAD 1983 (you'll either be in Zone 11 or 12, depending on whether you're west or east of Missoula, respectively). Information on nomenclature to use for recording tracks is on the field form.

also support other research in the area, and provide additional information regarding individuals, genetic source population, and other information.

- If you have found a suspected fisher, wolverine, or lynx track in a grid, even if you are sure of the species identification, you will want to backtrack it in an attempt to find genetic material (hair or scat)
- Select the best representative track that you encounter in a grid, not necessarily the first track that you see, to backtrack. Ideally, you would complete a full survey of the grid (i.e. survey 6.2 or more miles), and then go back to where you found the freshest/clearest tracks.
- Remember to GPS the location of your snowmobile before you head out! Then turn the GPS on to Track function so that it will record exactly where you walk. On snowshoes, follow the animal's tracks backwards (to avoid accidentally encountering the animal), searching for hair or scat. Walk slowly alongside the track while visually scanning each footprint, tree bole, and downfall along the path, and sift through the top layer of snow in daybeds and foraging sites.
- How far should you go? Well, that's going to depend on how many samples you encounter, how hard the terrain is, how late in the day it is, etc. In McKelvey et al. (2006), they show that a 4 km backtrack will produce useable DNA more than 95% of the time for lynx tracks. But the average distance to collect amplifiable genetics was 1.3 km and 1.2 km for wolverine and lynx, respectively (Ulizio et al. 2006; McKelvey et al. 2006). So, the short answer is: as far as you can, logistically, or until you've gotten 3-5 samples. Scats typically amplify better than hairs, so if you get a few scats early on in the backtrack, you may want to move on to a new track.
- To collect hairs, use tweezers to grasp hair and place it into a vial with desiccant. Or if you suspect the hair is frozen into the snow, scoop up the hair and surrounding snow using the vial, to avoid stripping the hair from its follicle. Remember to wipe off tweezers with an alcohol swab and/or hold them over a flame for 5 seconds to burn off any residual hairs or DNA.
- To collect scats, scoop the whole scat into a paper bag (you'll transfer it to a vial after it dries at room temperature for a few days). Keep the paper bags as dry as possible while in the field.
- Remember to label the vial or bag immediately upon collecting the sample! The label should match the Genetics Sample ID used on the datasheet.
- See the "Protocols for Collecting and Storing DNA Samples" by Schwartz and Pilgrim for more information. A few key things to note:
    - Keep an eye on the desiccant—if it changes from blue to pink/white (or orange to white, depending on which kind you're using), add more dessicant!
    - Do not store samples in the freezer. Store them at room temperature.

    - Store scat samples in a dry spot for 3-4 days, then place them in a vial (or multiple vials) with desiccant. Keep a close eye on them for a few days, as they will likely need more desiccant.
    - The samples need to be taken to the Wildlife Genetics Lab at the Rocky Mtn Research Station in Missoula monthly. You'll also need to take the lab a list of what samples you are submitting in that bundle, as well as an electronic copy of the spreadsheet with sample information. Email this to Kristy Pilgrim (kpilgrim@fs.fed.us).
- Enter backtracking and genetics data into the Excel sheet "CarnivoreTrackSurveys2012.xlsx". Note that there are multiple tabs in this database—info from the top part of your backtracking field form will go in the Backtracks tab, and then info on genetics from the bottom and back of your field form will go in the Genetics Samples tab.

Multi-species Hair Snares (aka Bait Stations)

DNA (hair) snares are a non-invasive way to collect samples to help delineate the geographic range of forest carnivores in the study area. In addition, genetics from the samples can be used to determine which populations have native genes versus which are comprised of reintroduced individuals (for fishers), and to index the number of individuals in the study area (using minimum number of individuals alive).

- Use the 5x5 mile grid as your sampling area; within the grid your goal will be to deploy **at least 1 bait station per grid cell** (up to 4 bait stations may be placed within a grid, using the prioritization scheme that is being developed); placement of the bait station should target the best suitable habitat, and/or proximity to where target species have been detected in the past (avoid placing snares in very open habitat). If research trapping of lynx, wolverine, or fisher is occurring in your area, try to find out where the traps are being set to avoid those areas.

- Pick bait tree (≥12" diameter), apart from other trees (so animal can only access bait from bottom).
- Station #= Year_Grid cell_BS(Station number); example 2013_2495_01 is bait station 1 in grid cell 2495
- Pick camera tree 8-12' from bait tree. Make sure camera tree is small enough so lock will fit around it (or large enough to bolt the lock box on, if using that approach).
- Measure and record distance between camera and bait tree in inches.
- Take waypoint of camera tree in NAD83, average 80 time if GPS allows.
- Remove all branches that an animal might rest on when getting at the bait.

- Remove any branches on both trees which may potentially block camera view or trigger camera.
- Drive a spike or lag bolt into the bait tree between deer leg bones or nail the tail if using a beaver carcass. Then wire the bait securely to bait tree (bottom of bait 6' off ground).
- Screw 12 gunbrush holders to bait tree in two concentric circles.
- First circle will be 12" below bait, second circle 18" below bait.
- Do not place gunbrush holders directly below bait (so blood doesn't drip on gunbrushes).
- In each holder, place one gunbrush from above and tighten.
- Nail 2 lynx hair pads onto the tree (offset from the bait so that bait does not drip into pads), starting at 18” above current snow level (if it has just snowed a big fluffy snow, go 12” up, to account for the snow settling and compressing). Place another pad 12” above the first one. Pads should be pre-soaked with lure and have dried catnip sprinkled on them.
- Hang a dangle in a nearby tree, in a spot that gets the greatest visibility from all directions. Dangles can be cd’s, tin foil or tin pans, duck wings, deer tails, etc., hung from fishing line, to act as visual attractants.
- Hang a sponge soaked in lure from a nearby tree (not in the way of the camera). Poke tie wire through the sponge, then loop over a branch. Put in a spot where wind drifts will catch it, but where it’s somewhat sheltered from falling snow/rain, if possible. Flag the wire a few inches up to make it easier to find on return. Tip: hang lure sponge in the opposite direction from where you’ll likely be approaching the bait station, to save yourself from accidentally walking into it!

If using a camera at the bait station:

- Attach criminal tape to bait tree, in view of camera, extending from bait to snow.
- Nail station name placard below bait.
- Confirm memory card and charged batteries are in camera.
- Record camera model and serial number.
- Lock camera to tree making sure camera is at same height as bait.
- Remove key from lock and record key number.
- Walktest' camera (i.e. walk in front of the bait and make sure the camera takes a picture).
- Flag camera tree (do not block camera view!).

Bait station Re-baiting or Removal:

- Bait stations should be checked and re-baited/re-lured, or removed, within 21-30 days (tip: there’s a calendar in your field notebook for recording when you need to pick up bait stations)
- When approaching a bait station, be sure to make noise to alert any creatures of your presence. Towards the end of the season, you should carry bear spray with you.

- Be aware of and document any carnivore tracks in the vicinity of the bait station. Also collect any scats within a 20' or so radius of the bait station that may be from forest carnivores.
- If re-baiting, make sure to have lure, bait, and extra gun brushes and hair pads with you.
- Whether rebaiting or removing the bait station, you'll want to collect any hair samples before you do anything else.
    - DO NOT TOUCH HAIR ON GUN BRUSHES OR HAIR PADS WITH YOUR BARE HANDS; use latex gloves or coated cloth gloves, or use your leatherman to hold onto the gun brush and drop it directly into the vial
    - Any gun brushes that have hair on them should be dropped directly into a vial with desiccant; remember to label the vial immediately, using nomenclature specified on the data sheet
    - Any lynx hair pads with hair on them should be carefully removed from the tree, and placed in a paper bag (you may then want to temporarily put this inside a plastic ziplock bag; upon returning to the field station, put the paper bags into a Tupperware containing extra desiccant to keep the samples dry (if the hair pad is really wet, let it air dry for a day or two before returning it to the Tupperware for longer-term storage)
    - Samples should be stored at room temperature, and taken to the lab monthly (as with samples from backtracks, described above)
- If using cameras, remove camera. Download and label the photos (see field form) upon return to the field station.
- Remove all flagging, bolts, dangles, etc. Take all non-biodegradable things with you.
- Pitch bait or bait remains into the forest.

LOCATION OF DATASHEETS AND DATABASES (for FS folks):

O:\NFS\Lolo\Program\2600WildlifeMgmt\MonitoringAndFieldWork\SpeciesSpecificMonitoring\Winter Carnivore Track Surveys_and_Fisher DNA\Data Sheets

O:\NFS\Lolo\Program\2600WildlifeMgmt\MonitoringAndFieldWork\SpeciesSpecificMonitoring\Winter Carnivore Track Surveys_and_Fisher DNA\Databases (*Make sure to use the ones that say 2013!)*

Check with your forest biologists on appropriate places to store filled-in databases and photos.

SAFETY

Winter field work is inherently dangerous, due to extreme weather conditions that can render otherwise minor accidents into severe situations. In our training we will go over tips for conducting work as safely as possible. A few things to remember:

- No data are worth you risking your life to collect!
- Follow your agency/group's check-in/check-out policies. Always make sure to document where you're going and make sure someone is expecting you to return!
- Carry multiple communication devices—FS radio, cell phone, satellite phone, and/or SPOT tracker—and know how to use them/where each is effective.
- Be aware of changing snow conditions and areas where avalanches are likely. We will do a full day of avalanche safety and awareness training at the beginning of the season, but you will need to stay aware of conditions throughout the season. Good websites to check frequently to find information on current avalanche conditions are http://www.missoulaavalanche.org/ and http://www.flatheadavalanche.org/.
- Stay aware of your surroundings, and constantly assess the risks of what you are doing/where you are traveling. Especially when conducting track surveys and backtracking, when you're focusing on the ground so much, remember to look up frequently to see what the surrounding conditions are like.

Appendix A: HOW TO DIGITIZE SURVEY ROUTES

1. CREATE A NEW SHAPEFILE FOR STORING YOUR TRACK ROUTES:
    a. Open ArcCatalog and navigate to the folder where you want your survey route shapefile to be saved (for Lolo folks, it's T:\FS\NFS\Lolo\Program\2600Wildlife\GIS\WildlifeData\WinterCarnivoreSurveys)
    b. Right click in the view box on the right and click New-> Shapefile
    c. Give it a name (e.g. 2011_WinterCarnivoreSurveyRoutes), and under Feature Type select Polyline
    d. In the Description box click Edit, which will open up a box with Spatial Reference Properties
    e. Click Select
    f. Double click Projected Coordinate Systems
    g. Double click State Plane
    h. Double click NAD 83 (NOT NAD 83(Feet))
    i. Select NAD 1983 StatePlane Montana FIPS 2500.prj
    j. Click Okay a few times, until you're back at the ArcCatalog window
2. GET SET UP TO ADD YOUR TRACK ROUTES IN ARCMAP:
    a. Open ArcMap and bring in whatever background data you need to show roads/trails that you have surveyed, as well as any other reference data you need (for Lolo folks, open WildlifeBaseMap.mxd in T:\FS\NFS\Lolo\Program\2600Wildlife\GIS\Maps, then Save As a new .mxd in T:\FS\NFS\Lolo\Program\2600Wildlife\GIS\WildlifeData\WinterCarnivoreSurveys called (year)_WinterCarnivoreSurveys
    b. Zoom in to the general area where your surveys began
    c. Set the scale to 1:24,000 (in the standard toolbar, there should be a scale box and 1:24000 is one of the dropdown options); readjust your view if needed to capture all or at least a good part of your survey route in the view
    d. Click the Add Data button and navigate to the shapefile you just created in step 1 above
    e. Open ArcToolbox and slect Data Management Tools, then Fields, then Add Field
        i. Under Input Table select the shapefile that you created and just added in (e.g. 2011_WinterCarnivoreSurveyRoutes)
        ii. Under Field Name type in SurveyID
        iii. Field Type select TEXT
        iv. Leave the rest of the boxes as is and hit OK
    f. From the Editor Toolbar click Start Editing (Make sure you have the Editor tool bar turned on; if not, go to View->Toolbars and select Editor)

        i. Scroll down to find the location of your shapefile and click Okay (if you get a message about spatial reference, go ahead and click okay)

3. START TRACING—AT LAST!
    a. From the editor toolbar, select the pencil icon (sketch tool)
    b. Move your mouse to the starting point of your track survey route; you should be seeing a little blue circle with a crosshairs over it
    c. Single click to start drawing, and continue single-clicking along your route; when you're done with that route, double click your last point to end the tracing
    d. Now right click on the shapefile in the Table of Contents and select Open Attribute Table
    e. The line you just digitized will be highlighted in this table. Under SurveyID, enter the survey id information exactly as it appears on your datasheet (e.g. 1372_020711)
    f. Close the Attribute Table, and repeat steps a-e for each survey route you need to enter
4. WHAT IF I MESS UP?
    a. If you double click too soon and end the route, just go to the Attribute Table and right click the row in the table that corresponds to your goofup, and hit Delete Selected
    b. If you mess up a route while you're digitizing it, go ahead and end it by double clicking, then deleting the row in the Attribute Table as described above
    c. If your route runs off the screen, do not double click while digitizing, but go up and get the PAN tool (the little hand) and drag your map to show where you need to go, then pick up the Pencil tool and continue digitizing
5. SAVE YOUR WORK!
    a. After each survey route or so that you digitize in, go up to the Editor toolbar and click Save Edits
    b. Once you've digitized in all of your survey routes, click Save Edits, and then Stop Editing under the Editor toolbar

Appendix B: TRANSFERRING WAYPOINTS FROM GPS UNIT BACK TO COMPUTER

- If you don't have DNR Garmin on your computer, download DNR Garmin 5.4.1
- Turn on GPS and connect to computer
    - Open DNR Garmin, make sure it says connected in the lower left of DNR Garmin,
    - Make sure the projection for DNR Garmin and the GPS are both in NAD83 UTM 12 or 11 by going: File… Set Projection set to NAD 83 and UTM zone 11 or 12 N and hit OK.
    - In DNR Garmin click: Waypoint… download (this brings all the points that are on the GPS into DNR Garmin)
        - If you have tracks on your GPS you want to save click: Tracks…download
    - Once all of the waypoints are downloaded select the points you want to save
        - Go to: File…Save to…file…navigate to where you want to save the waypoints
        - Make sure the 'save as type' is set on Arc View Shapefile (projected)(*.shp)
        - Name the file
            - click save
    - Now navigate to where you saved the file
        - Check to see if there is a projection file (prj), along with the DBF file and others saved with the same name for that waypoint data set
            - If there is no projection file that was saved from the GPS waypoints, find another (prj) file from another data set or folder, double click on it and make sure it is in NAD83 utm Zone 12/11 the one that you want, copy and paste this (prj) file next to the data set you just saved without the (prj) file and change the name to match the data set that is missing the (prj) file, this should allow the waypoints to be projected correctly in ArcGIS

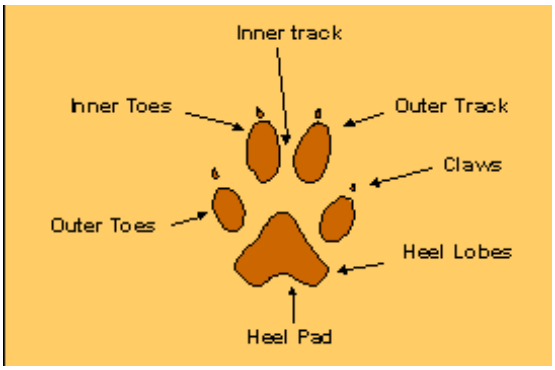
- Turn on GPS and delete any unwanted waypoints or tracks that are on the GPS unit
    - connect GPS to computer
    - Open DNR Garmin (make sure it says 'Connected' in the lower left on DNR Garmin)
    - File…set projection…NAD83…UTM Zone 12 (for east lolo) or 11 (for west lolo), make sure GPS is in the same projection also
    - File…load from (wherever the points are located, example) T:…FS…NFS…lolo…program…2600Wildlife…GIS…mmayernik(or whatever file)
        - Be sure to select ArcView shapefile for 'file type'… open the file
    - When a box comes up choose 'Spatial ID' for the name
        - DNR Garmin will load all of the points (a box will come up that says the points were successful)
        - Next click…Waypoint…Upload (this brings the points onto the GPS) when completed it will say transfer complete on the GPS unit
            - Scroll around on the GPS and make sure the waypoints transferred and are in the right location on the GPS base map

Appendix C: MEASURING CARNIVORE TRACKS

You need to measure the length and width of tracks. When measuring animal tracks the length readings between tracks are measured from toe to toe because animals hit first with their toes.

Establish the Line of Travel- This can be done by eye if the tracks are clear or by placing popsicle sticks at the heel of the tracks and connecting a string to the sticks (I copied and pasted this part… I'm sure you'll have popsicle sticks handy!)

1. **Length of Track** - measure the length of the true track.
2. **Width** - measure the widest part of the track.
3. **Stride** - is measured from the heel of one foot to the heel of the other foot (i.e. right heel line to left heel line).
4. **Straddle** - if you draw a line of travel between the left heels and a line of travel between the right heels the distance between these two lines is the straddle. There is zero straddle and positive straddle.



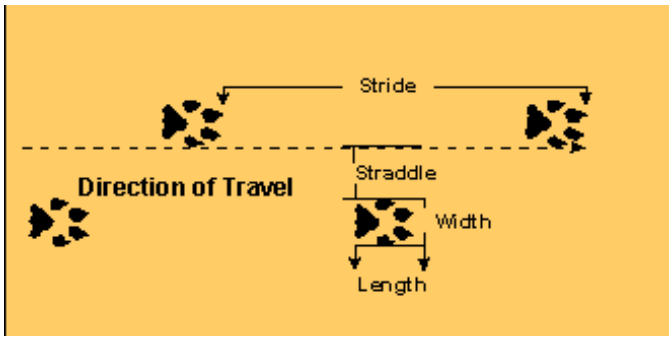


Table 1. Brief key to identifying tracks to family.

Family	**Claws**	**Asymmetrical**	**Heel pad**	**Largest foot**
Canines	Yes	No	One leading lobe	Front
Felines	No	Yes	Two leading lobes	Front
Lagomorphs	Yes	Yes	Long track	Hind
Mustilids (weasels)	Yes	Complex	Small-Medium	Bounding gait
Bears	Yes	Simple	Large	Like human foot
Raccoons	Yes	Simple	Medium	Like human hand

Appendix D: CONTACTS

If you have additional questions about protocols, supplies, coordination, etc., please contact one of the following people:

Carly Lewis, Wildlife Technician, Lolo National Forest
cwlewis@fs.fed.us; (406)329-3848; (406)544-0963 (cell)

Scott Tomson, Wildlife Biologist, Seeley Lake Ranger District, Lolo National Forest
stomson@fs.fed.us; (406)677-3925

Lorraine Brewer, Forest Wildlife Biologist, Lolo National Forest
lbrewer@fs.fed.us; (406)329-3792

Amy Jacobs, Wildlife Biologist, Tally lake Ranger District, Flathead National Forest
ajacobs@fs.fed.us, (406)758-3544

Pat Shanley, Wildlife Biologist, Lincoln Ranger District, Helena National Forest Service
pshanley@fs.fed.us; (406)362-7006

Mark Ruby, Wildlife Biologist, Swan Ranger District, Flathead National Forest Service
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