

WINTER VOLUNTEER CARNIVORE TRACKING PROGRAM

DNR TRACKING SURVEY GUIDELINES

Sponsored by the Wisconsin DNR



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TRACKING CLASS PACKET

Appendix

Volunteer Tracker Background Information Form.....	v
Guidelines for Carnivore Tracking During Winter in Wisconsin.....	1
The History of Wolves in Wisconsin.....	1
Background and Goals of the Carnivore Tracking Program.....	2
A New Way to Survey: The Wolf Occupancy Model Explained.....	2
Allocating Survey Effort.....	2
The Occupancy Model.....	4
Take-home Points.....	5
Tools You Will Need.....	6
Conducting Your Survey.....	7
General Survey Information.....	7
Completing the Data Forms.....	8
Tracking App.....	10
Recording Tracks When You Encounter Them.....	12
Encountering Tracks of Rare Species.....	14
If You Have Problems Identifying a Track.....	14
Using the Discriminant Analysis Form.....	15
Tracking Ethics and Cautions.....	15
Reporting Your Results.....	16
Frequently Asked Questions	16
Maps, Quick References, Example Forms, and Blank Forms	
2020 -2021 Wisconsin Carnivore Tracking Blocks.....	17
Measuring Tracks and Stride.....	18
Gait Patterns.....	19
Characteristics of Tracks Targeted on Wisconsin Carnivore Track Surveys.....	20
Canid Track Identification.....	21
Example Datasheet: Carnivore Track Survey (Form 1700-052).....	23
Example Datasheet: Wolf Track Survey Summary (Form 1700-054).....	26
Example Datasheet: Carnivore Track Annual Survey Summary (Form 1700-053).....	27

Carnivore Track Survey (Form 1700-052).....	29
Wolf Track Survey Summary (Form 1700-054).....	33
Carnivore Track Annual Survey Summary (Form 1700-053).....	35
Discriminant Analysis – Suspected Wolf Tracks (Form 1700-055).....	37
Digital Carnivore Tracking Survey Field Reference Guide.....	39

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Volunteers are an essential part of the Wisconsin Carnivore Tracking Program's success. We appreciate your hard work and dedication. Thank you for participating.

Notice: Provide background information requested on this voluntary form. Information will be used for Carnivore Tracker program administration purposes. Personally identifiable information is not intended to be used for other purposes. Wisconsin's Open Records law requires the Department to provide this information upon request [ss. 19.31 - 19.69, Wis. Stats.].

_____ Block Assignment
_____ Sent Tracking Packet

Volunteer Information

Date		Name		
Address				
City			State	ZIP Code
Date of Birth	Home (Area Code) Phone Number	Work (Area Code) Phone Number	E-Mail Address	

Courses or workshops attended in mammal tracking:

Other training in wildlife biology:

Is there a specific county or general region that you would like to survey? Factors to consider are distance from home, nearness of cabin or place to stay nearby.

Other Considerations

Do you own or have access to a 4-wheel drive vehicle? <input type="checkbox"/> Yes <input type="checkbox"/> No	Do you own or have access to a snowmobile? <input type="checkbox"/> Yes <input type="checkbox"/> No
Do you cross-country ski or snowshoe? <input type="checkbox"/> Yes <input type="checkbox"/> No	Do you have any physical limitations for tracking animals in cold, snowy conditions? <input type="checkbox"/> Yes <input type="checkbox"/> No
If you have had no prior field experience we will assign you to co-track a block. Would you have a problem with this? <input type="checkbox"/> Yes <input type="checkbox"/> No	May we include your name, phone number & e-mail address on a tracker ID list? <input type="checkbox"/> Yes <input type="checkbox"/> No

Other interests and abilities that would be helpful in this program:

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GUIDELINES FOR CARNIVORE TRACKING DURING WINTER

Revised September 2020

These guidelines explain how to prepare for and conduct snow track surveys following Wisconsin DNR protocol for carnivore track surveys. It is important that track surveys are conducted in a consistent manner by all trackers. If surveys differ in the way they are conducted, it is impossible for DNR scientists to assess whether results were different because different procedures were followed or if carnivore abundance really differed between survey blocks. Therefore, we ask that you read all directions before conducting your first survey and contact your regional coordinator or us if you have any questions. In addition, take this guide into the field with you when conducting surveys and refer to it as necessary.

Survey forms and maps can be downloaded from our website. Go to the WDNR website homepage and type "carnivore tracking" in the search box. The first link listed will take you to the volunteer tracking webpages.

Thank you for your time and interest in helping monitor Wisconsin's carnivores.

The History of Wolves in Wisconsin

The gray or timber wolf has existed in Wisconsin from the time the glaciers melted, about 10,000 years ago. Wolves followed herds of muskox and caribou that moved in after the ice melted. Native Americans also followed the wolves and grazing mammals and have coexisted with these large mammals since the glaciers receded. The wolf was highly respected for its hunting skills and became an important symbol in the culture of many Native American tribes.

Europeans began settling Wisconsin in the early 1800's, and at the time as many as 3,000 to 5,000 wolves may have existed in the area. Europeans often had more negative attitudes toward wolves, and soon began programs to eliminate wolves. A state bounty was placed on wolves in Wisconsin in 1865, which lasted until 1957. By 1950, less than 50 wolves remained in extreme northern Wisconsin. In 1957 wolves were listed as a protected species, but by 1960 they were considered extinct or extirpated from the state.

In 1967 and 1974 the U.S. Fish and Wildlife Service designated the eastern timber wolf a federally endangered species. In 1975, wolves were listed as a state endangered species as they began to recolonize along the Minnesota border. Wolves were not reintroduced into Wisconsin.

Intense monitoring of wolves by the Department of Natural Resources (DNR) began in 1979. Attempts were made to capture, attach radio collars, and radio-track wolves from most packs in the state. Additional surveys were done by snow-tracking wolf packs in the winter and by howl surveys in the summer. In 1980, 25 wolves in 5 packs were detected in the state but dropped to 14 wolves in 1985 when parvovirus reduced pup survival and killed adults. The Wisconsin DNR completed a wolf recovery plan in 1989. The recovery plan set a goal for reclassifying wolves as threatened once the population remained at or above 80 for three years. Recovery efforts were based on education, legal protection, habitat protection, and providing compensation for problem wolves.

In the 1990's the wolf population grew rapidly, despite an outbreak of mange between 1992 -1995. The Wisconsin DNR completed a new management plan in 1999. This management plan set a delisting goal of 250 wolves in late winter outside of Indian reservations, and a management goal of 350 wolves outside of Indian reservations. In 1999 wolves were reclassified to state threatened status. In 2004 wolves were removed from the state threatened species list and were reclassified as a protected wild animal. On April 2, 2012 gray wolves were designated as a game species in Wisconsin.

Wolves were federally reclassified to threatened status on April 1, 2003, but on January 31, 2005 wolves were relisted as endangered due to a lawsuit. Wolves were delisted from the federal list in Wisconsin and the remainder of the Western Great Lakes Distinct Population Segment on March 12, 2007 (with MI, MN, and parts of ND, SD, IA, IL, IN & OH). Wolves were federally relisted on September 29, 2008, federally delisted on May 4, 2009, and relisted on July 1, 2009. Wolves were federally delisted on January 27, 2012, but again relisted on December 19, 2014. The count in winter 2016-17 was 925-952 wolves which was up from the 866-897 counted the previous winter. The most recent count included 232 packs and 28 loners statewide. This included 19 wolves counted on Indian reservations.

Background and Goals of the Carnivore Tracking Program

Wisconsin DNR researchers have conducted furbearer track surveys since 1977. In 1979, the DNR began conducting formal wolf track surveys as part of the state wolf monitoring program. A separate survey program for American Marten began in 1981. The carnivore tracking program grew out of these earlier surveys and was instituted in 1995. It is a cooperative effort in which DNR staff and volunteers participate. The current goals of the survey are to:

1. In combination with other data, determine the number, distribution, breeding status, and territories of wolves in Wisconsin.
2. Monitor the abundance and distribution of other medium and large sized carnivores on the landscape.
3. Monitor the existence of rare mammals such as; Canada lynx, cougar, wolverine, and moose.

A NEW WAY TO SURVEY: THE WOLF OCCUPANCY MODEL EXPLAINED

Allocating Survey Effort

Choosing how to allocate survey effort to estimate wolf abundance is an important consideration, with implications for efficiency and accuracy. In the past, Wisconsin has used a territory mapping approach to estimate wolf abundance. This approach is most efficient when effort is preferentially directed toward areas historically known or suspected to contain wolves. This has worked reasonably well, but for various reasons detailed elsewhere, Wisconsin will now estimate wolf abundance using an occupancy modelling framework.

Snow-tracking data will still comprise most of the data used in model, and the actual tracking procedure will change little. However, the occupancy modelling approach requires that sampling be representative of the landscape occupancy, so effort must be allocated so that the data collected are representative of the population from which they are sampled. Focusing survey effort primarily in areas known or suspected to contain wolves will result in occupancy estimates that are too high. A simple thought experiment and simulation will illustrate the point, in the extreme.

Imagine a situation where there are 300 sample units, half of which contain wolves with probability 0.2 and the other half contain wolves with probability 0.8 (thus, the average occupancy probability is 0.5). Let's suppose half of the sample units are surveyed either 3 or 6 times, and that detection probability (the probability that the presence of wolves will be detected, given that they are indeed present in the given unit) is either 0.3 or 0.6. Suppose further that observers have considerable knowledge and experience, and thus can zero in on the 150 units that have the greater occupancy probability.

In one scenario the observers survey only the best units (where occupancy probability = 0.8), and in the other scenario the 150 units to survey are randomly chosen. It seems intuitive that the former scenario will lead to positive bias in occupancy probability, because the chosen units are not representative of the entire set of all sample units. And indeed, the intuition is correct (Figure 1).

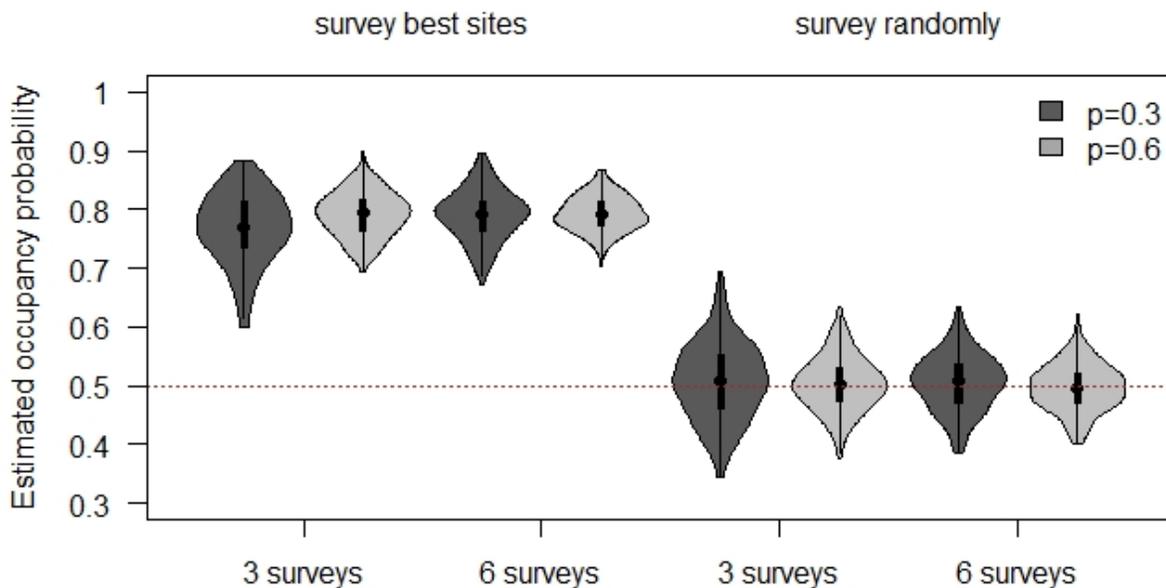


Figure 1: Average estimates of occupancy probability for 8 different scenarios where either only the greatest probability sites are surveyed, or survey units are randomly chosen. In each scenario, half of the 300 units have occupancy probability 0.2, and half 0.8 (average = 0.5, the dotted line). One hundred fifty units are selected for either 3 or 6 surveys. Each violin plot represents the posterior means of 200 simulated datasets.

It is clear from the simulation results (which illustrate a worst-case scenario) that surveying only the best units' results, on average, in positive bias in the occupancy estimate. Clearly, the patterns observed in the units with occupancy probability = 0.8 cannot be extrapolated to the units with

occupancy probability = 0.2. Increased effort and increased detection probability results in better estimator precision, because those situations produce more data to fit the occupancy model. Interestingly, surveying only the best units also results in better precision, because occupancy probability = 0.8 results in more data than occupancy probability = 0.2. But those more precise estimates are precisely wrong, because the selected sample units do not correctly reflect all the sample units.

Of course, observers can never perfectly select only the sites with the greatest occupancy probability, so these simulation results demonstrate an extreme situation. Also, in reality there are landscape covariates that help to predict occupancy probability, and incorporating such covariates helps to reduce bias, but most effectively so when selected sample units reflect the breadth of the distribution of covariate values. Nevertheless, the point remains - non-representative selection of sample units will result in non-representative estimates of occupancy probability, and consequent faulty conclusions.

Two other points are important. First, wolves may occupy an area even if they are not detected. To estimate that probability, repeated visits in at least some sample units are required. Second, there is an obvious tradeoff between increasing the number of repeat visits and the area that can be covered. The optimal allocation of a fixed amount of effort among sample units (to minimize bias and maximize precision) is difficult to predict and depends on both the occupancy probability and the detection probability. But, in general, more repeat surveys in fewer sample units is better than few repeat surveys in more sample units.

For example, suppose there are 300 sample units, occupancy probability is constant among them, and there are enough resources to conduct 600 surveys. In that case, it will generally be better to conduct 4 surveys each in 100 units and 1 survey in the remaining 200 (or 6 surveys in 100 units and none in the remaining 200), than to conduct 2 surveys in all 300 units.

Of course, the actual situation is complicated by 2 factors. First, occupancy probability is not constant among sample units, and second, observers cannot explicitly allocate effort to specific units, because the sampling grid is imposed on the landscape after-the-fact, and effort is instead allocated according to convenience-defined tracking blocks. Nevertheless, if the entire survey block cannot be surveyed multiple times, we recommend that a portion of the block be selected for multiple surveys, even if it means that some parts of the block get surveyed only once or not at all. However, it is worth reiterating that, to avoid bias, it is crucially important that the block portions that are selected for focus are selected without regard to the expected occupancy of wolves (see Figure 1).

The Occupancy Model

Since it is usually impossible to physically count all the individuals in wildlife populations, it is necessary to instead use some sort of model to estimate the size of a population. An occupancy modelling approach is now used to estimate wolf abundance in several western states. In Wisconsin, the occupancy approach uses data from repeated snow-tracking surveys to estimate 1) the probability that sample units are occupied - i.e., contain part of a pack's home range, and 2) the probability that wolves are detected, given that a unit is occupied.

The detection probability informs about potential occupancy in areas where wolves were not detected. The total estimated occupied area is divided by the mean territory size, which is estimated from GPS locations of collared wolves, to estimate the number of packs in the surveyed area. This estimate is then multiplied by the mean pack size to derive a total abundance estimate. All of the estimates have uncertainty, and the uncertainty is carried through to the final estimate (this approach is conceptually depicted in Figure 2).

Patch occupancy modeling (POM) approach for estimating the number of wolves in Wisconsin (for internal use)

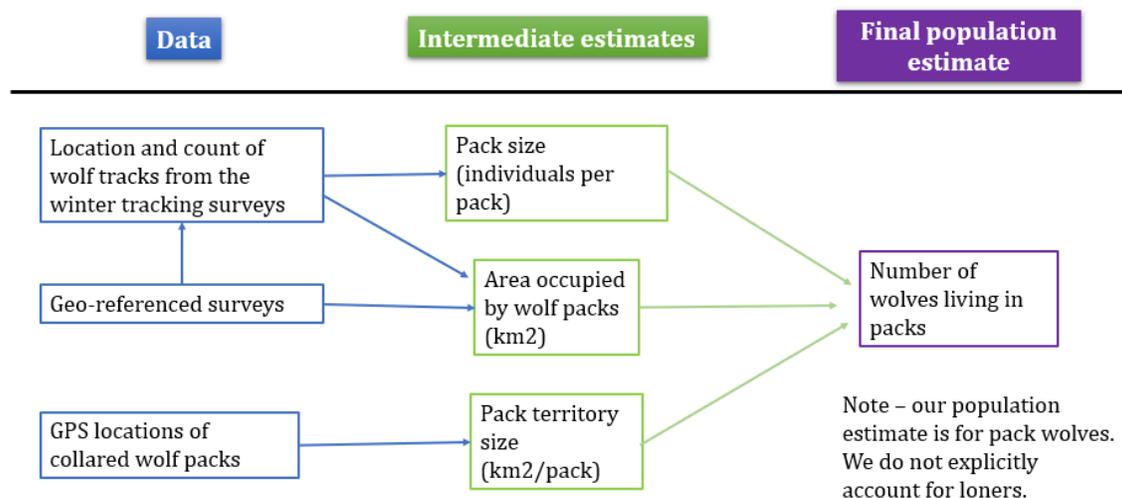


Figure 2: Conceptual depiction of an occupancy modeling approach to estimate wolf abundance in Wisconsin.

Take-home points

1. **Most valuable data = entire block is surveyed multiple times.** Surveying the entire block eliminates the potential of biasing the population by ensuring that the survey effort is not affected by prior experience in the block. Surveying the block multiple times allows estimation of detection probability, which provides information about whether survey blocks with no wolf observations were actually unoccupied or whether wolves were present but were just not detected.
2. **Valuable data = portion of block is surveyed multiple times,** but the portion surveyed must be selected randomly. Only surveying areas of a blocks where wolves are believed to be present wolves are will result in an overestimation of the wolf population. Conversely, surveying only areas where wolves are expected to be absent will result in underestimation.
3. **Data with some value = entire block is surveyed once.**
4. **Unacceptable data = any survey where the observer only targets areas where they think there are wolves or are no wolves.**

We know that it is very difficult to select survey routes while ignoring prior experience in the block. For that reason, we recommend switching blocks every year or two. Then, decreased experience in a block should more likely result in randomly selected survey areas.

If switching blocks is not possible, you could also use dice (or any random number generator) to decide where to go in a block. For example, you could number segments of road or townships within your survey block and roll the dice to determine which segments or townships to survey.

TOOLS YOU WILL NEED

1. A tracking guide: there are several good tracking guides available on the market. Our recommendations are listed below.

[A Field Guide to Mammal Tracking in North America](#) by James Halfpenny, 1986. This is the guide that we prefer for use in track surveys. This guide provides good explanations of measurements, gait patterns, special track identification, and provides excellent photos of scats.

[Mammal Tracks and Sign](#) by Mark Elbroch, 2003. It has excellent color photos and natural history information. Some terminology and measurement methods are different from what we use.

[Peterson's Field Guide to Animal Tracks](#) by J. Murie, 2005. This guide is the old standard for many trackers and is still a reliable, although not as complete guide.

[Tracking and the Art of Seeing: How to Read Animal Tracks and Sign](#) by P. Rezendes, 1992. Has excellent photos of animal tracks and other sign however, some of his information is inaccurate or outdated – so use with caution.

[Bird Tracks & Sign: A Guide to North American Species](#) by Mark Elbroch and Eleanor Marks, 2001. This guide is a good source for bird tracks and other sign but is not required for the purposes of the winter carnivore tracking survey.

2. A detailed map of the survey area: Detailed maps are available in the DeLorme Wisconsin Atlas and Gazetteer, available in many bookstores and sporting goods stores throughout the state. Other detailed maps may also be available at the county or regional level.

Maps of individual survey blocks can be downloaded from our website or can be obtained by contacting us. This is the map that you will need to attach to your survey – paper or digital. It is very important to use a copy of the block map to indicate your survey route and the location of wolf tracks for each survey.

3. Data sheets, clipboard, pencils, and cellphone: Take several copies of form 1700-052 – Carnivore Track Survey, and at least one copy of form 1700-055 – Discriminant Analysis form.

Please write in pencil or permanent ink; normal ink may run if the data sheets get wet. Use separate survey sheets for each block and each survey.

Make sure you also have your cell phone with your survey app open and logged into before you get to an area without cell phone service. The app will operate just fine without service, but you cannot open it initially without it. You should also keep a cellphone charger handy in case you need to plug your phone in before your finished surveying.

4. Rulers: preferably marked in inches and millimeters; the 6" ruler we provide at track training classes is good for photographing next to individual tracks. A tape measure is useful for measuring stride length, and you may want a yard stick for measuring snow depth.

5. Camera

6. Winter Safety Equipment: such as a shovel, cell phone charger, sand, blanket, and matches.

7. Optional Equipment: Snowshoes, skis, Geographic positioning system (GPS) unit for determining location of tracks.

CONDUCTING YOUR SURVEY

General Survey Information

1. Species to look for:

- Wolf
- Coyote
- Fox (red and gray)
- Domestic Dog
- Black Bear
- Bobcat
- Domestic cat
- Lynx
- Cougar
- Badger
- Fisher
- Otter
- Skunk
- Raccoon
- Beaver
- Porcupine

2. A typical all-day survey should cover 20-30 miles. If you are responsible for surveying more than one block, you should survey 20-30 miles PER BLOCK. Shorter surveys are still useful when time is limited but you should get at least 3 all day surveys in per season.

3. Vehicle surveys should be conducted at driving speeds of less than 10 miles per hour. Otherwise you will probably miss many tracks.

4. When to conduct surveys – surveys should be conducted when snow conditions are good for identifying tracks. You can check this by making some tracks the evening before you plan to go tracking. If you can still see reasonable detail in the tracks the next morning, it is reasonable to go tracking.

Snow Conditions: Heavy snowfalls of 8" or more generally provide poor tracking conditions and should be avoided. A fresh dusting of snow often provides excellent tracking; windblown snow can

also provide good tracking conditions but wind during a survey will cover up tracks. Wet snow will show more detail than dry powdery snow.

Temperature: Animals don't move as much in very cold weather, so avoid surveying in very cold negative temperatures. During early and late winter, temperature fluctuations can result in good tracking conditions in the morning that deteriorate into poor conditions by afternoon.

5. There are no specific survey routes. You should cover as many miles of unpaved, snow covered roads as possible per survey. Regional coordinators can provide advice on areas to track if you are uncertain. Miles driven from one tracking area to the next should be excluded from the survey and highlighted route.

6. In blocks with large areas that can't be driven – these areas can be surveyed by snowshoeing, skiing, or snowmobiling.

7. Try to conduct at least 3 surveys per block between December and the end of March.

COMPLETING THE DATA FORMS

Observer(s): List all observers conducting the survey.

Sheet number: Enter the page number of this sheet and the total number of sheets for this survey.

Survey block: Write the survey block number

County: List all counties in which tracking took place (some blocks cover portions of two or more counties).

Snow depth: Measure accumulated snow in an area off the road.

New snow depth on road: Indicate the amount of snow on the road surface or edge.

Pack name or general area: List the name of any known packs in the area or write the general area such as "east side B32".

Temp: Indicate temperature in degrees Fahrenheit at the start of survey.

Time of last snow fall: If it has been less than 48 hours since the last snowfall occurred, record in hours. If it has been longer than 48 hours, record in days.

Begin survey – Lat/Long: Your Latitude and Longitude coordinates can be acquired from GPS units, cellphones, google maps and several other mapping apps.

Survey date: date of the survey.

Start time: The time that you began the survey, please use a 24-hour time format (military time).

End time: The time you finish surveying for the day – again use 24-hour time. Please indicate if you take an extended break between routes.

Cloud cover: Check the appropriate box for estimated percent cloud cover.

Past weather: Indicate the high and low temperatures over the past 24 hours. Some weather apps that provide past weather data are NOAA, NWS, and Weather Underground.

Precipitation: Note any precipitation over the past 24 hours.

Tracking conditions: Ranked on a scale of 1 to 4, 1 being poor, and 4 being excellent.

Poor (1) = Many prints do not register; identifications are mainly from stride and gait patterns.

OK (2) = Most prints register but often lack detail. May need to follow into woods to identify.

Good (3) = Every print registers, but many do not show good detail.

Excellent (4) = Every print registers and shows good detail.

Roads and Direction of travel: At the start of the survey enter the intersection, direction of travel, and name of the road you're traveling on. Enter the name of the road and your direction of travel whenever you change the road you're traveling on.

Indicate on map: On your tracking block map, indicate your starting point and direction of travel. Show your route and document any wolf sign you encounter.

Mileage: The intersection where you begin your survey is mile 0. Reset your car's odometer or your pedometer at this time. Make a note of your odometer reading every time you enter a new road and at every identified carnivore track.

If you turn around or drive twice over any section of road, only count the mileage once. For example, if you survey a 6-mile dead end road and turn around the number of miles surveyed would be 6 not 12.

* When using the tracking app, you will want to pause and restart your track line in these situations to avoid sloppy tracking lines. You will also want to pause and restart your track line while traveling to your next tracking destination. For example: you reach the end of an unpaved forest road and turn onto a county road or highway to travel to the next spur of forest roads you plan on tracking. The miles in between these spurs do not go into your total miles tracked for the day.

Total number of miles should indicate the number of miles actually surveyed.

Carnivore groups: Write the number for each animal's tracks observed under the appropriate column. Be sure to include the animal's initial along with its track count. Example: 2 wolves = 2W, 1 fox = 1F, 3 coyotes = 3C.

Notes and comments: Indicate the direction of travel, track measurements, observations of scats and urination for any wolf sign observed. If available, list UTM coordinates.

Totals: Summarize total miles and total observations of each animal.

TRACKING APP

It is **strongly encouraged** that you use the app, however if you do not have a smart phone the paper survey forms will still be available on our website (and included at the back of this packet). It is recommended that for your first several surveys you should record a paper copy as a backup for your mobile app survey. Survey block maps can be also be downloaded from our website or requested from your regional coordinator. Go to the WDNR homepage and type “carnivore tracking” into the search box. The first link listed will take you to the volunteer tracking webpage.

For the past 40 years data has been recorded on hard copy survey forms these forms are still widely used. However, they can be very complicated to use and can leave much room for ununiformed data entry that includes errors or misinterpretations of what data needs to be entered. Hard copy forms require substantial time for submitting, editing and entry into a digital database.

Why move from a system that has worked for the last 40 years? It takes the data manager close to 600 hours to process hardcopy data which could be autonomously entered through a digital system. Each year we have over 120 citizen scientists and 40 DNR staff participate in our winter tracking surveys. In the past all data was recorded on hard copy forms which were then scanned/mailed to us for review and entry into an online database. This requires an average of **320 hours of labor/year** and an additional **250+ hours/year** to manually digitalize all the tracking routes.

With the implementation of the occupancy model, growing population, and the fact that using the app means no time lag in survey form submission. As well as offering automatic check for blank / missing data, predetermined answers, autonomous data entry, queried databases, offline data recording, private access accounts the initial effort to switch to a digital survey will be well worth the trouble. With all those incredible features in mind, the biggest reason is digitalizing a travel route.

With recent updates to the application platforms we are also providing a training survey so that you can practice using the app, learning all the tips and tricks without worrying about accidentally sending in a test survey. The training survey functions exactly the same way as the official survey. You can even submit your practice routes to get the full experience!

QuickCapture also has a live view of your location and your track line that you can look at, at any point in your survey. Paired with the hub site that will allow you to login on your desktop and see all of your track routes you have completed for the season so far. Allowing you to get a better idea of where you have surveyed, and where you still need to go.

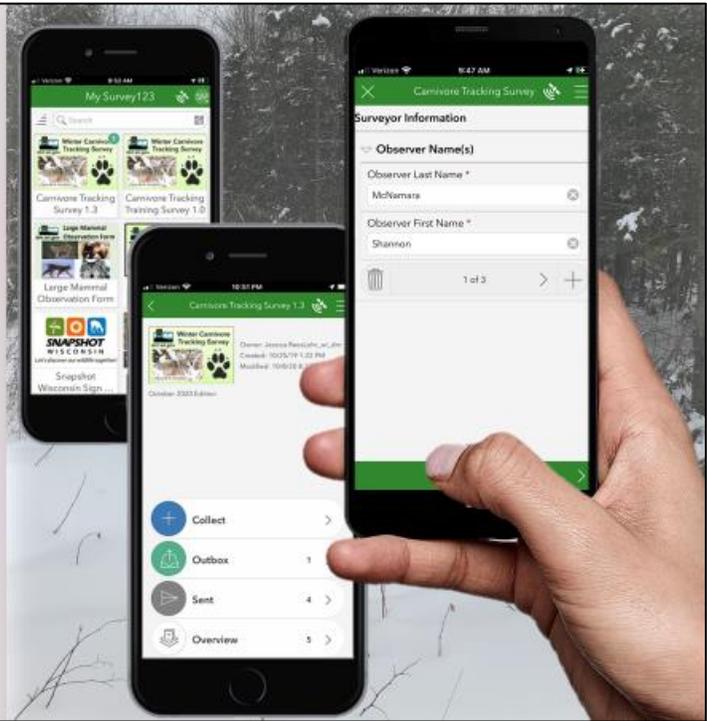
Our survey runs from 2 apps that you will need to download, either from the App Store for iPhones, or Google Play for Androids. You will need to search for “Survey123 for ArcGIS”, “ArcGIS QuickCapture” and download them both. You will be given login information at your live session in December, where we will walk you through logging in for the first time as well as how to use the hub site.

The following images are basic instructions on how the app functions, there is also a quick reference sheet included at the back of the packet. As well as an entire training module dedicated to using the survey app.

Starting your survey

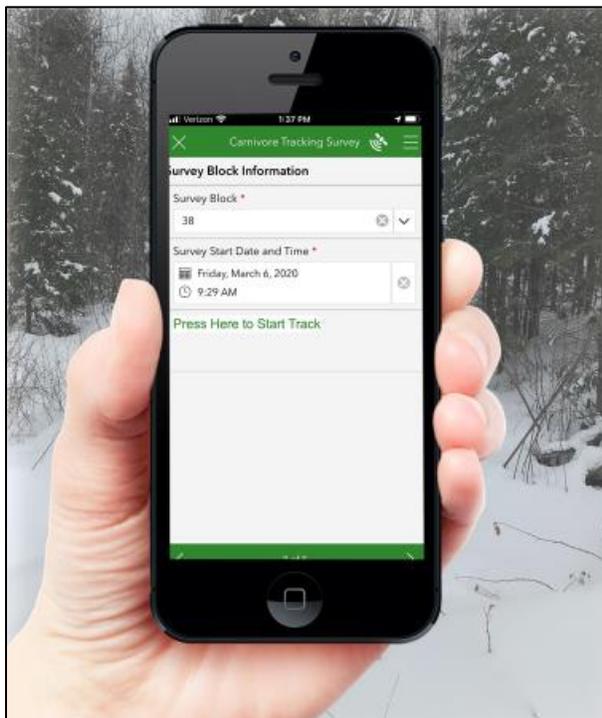
You're in the field and ready to begin your survey, here's how to begin:

1. Open Survey123 and sign into your account if necessary.
2. Select "Collect" at the bottom of your screen to open the digital survey form.
3. Enter your name – Last, First.
 - If there are more people with you, select the "+" button to add another observer
4. Once all observer names have been entered, select the "next" arrow at the bottom right of your screen.



Enter Block Information

1. Select your block from the scroll-down list of options.
 - You can enter your block by scrolling down through the available blocks or by starting to enter your block's number.
2. With your block selected, select "press here to start track".
3. The QuickCapture app will open.
4. Select "click here to start stop track" to start recording your track route. The button will flash when the route has started.
5. Return to Survey123 and select "next" to go to the next survey page.

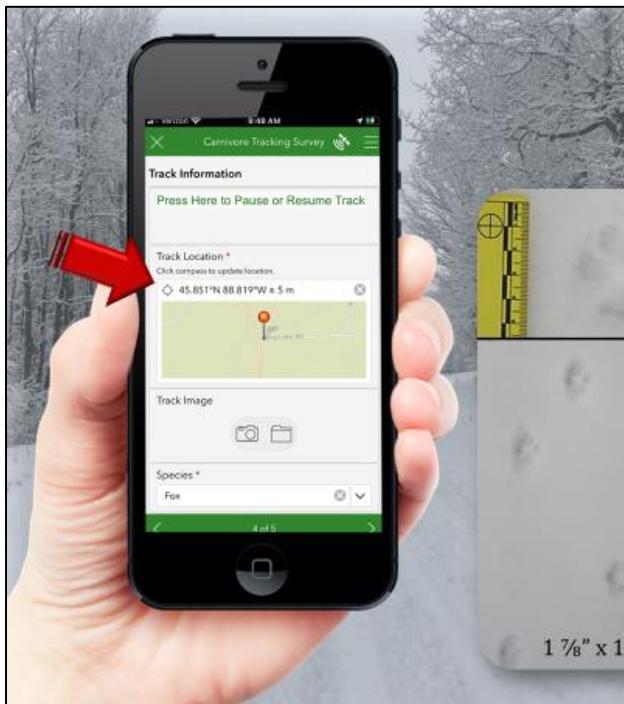
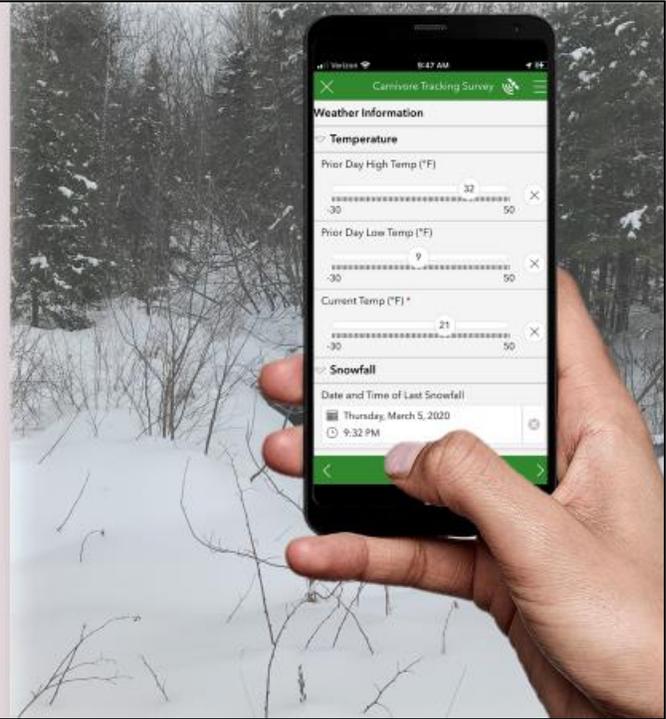


Weather Data

If you are unsure of any non-required data, you can return to the survey and enter them at a later time.

1. Prior day high and low temperatures are not required.
2. Enter current temperature. Select date and time of last known snowfall.
3. Enter total snow depth
 - Woods depth is measured to nearest quarter inch.
 - Road depth is measured to nearest tenth inch.
4. Enter amount of precipitation in last 24hrs and select amount of cloud cover at the start of your survey.

Remain on this page until you come to your first track.



Recording a Track

Making your first waypoint

1. Select the arrow on the bottom right of your screen.
 - The first time you select this button, Survey123 will drop a waypoint for your first track location.
2. Adding subsequent waypoints
 - First press the compass icon on the top left portion of the map to bring the point to your new location.
 - The compass icon will flash while the app updates to your new location.

WHEN YOU ENCOUNTER TRACKS

Consult your tracking guide to identify the species that made the tracks.

Several tracks may need to be observed before a species can be identified.

Different species may have tracks that look similar. Therefore, pay careful attention to gait patterns (the sequence of foot movements) when identifying tracks. A good tracking guide such as Halfpenny's will describe the gait pattern associated with each species.

Tracks and gait patterns will vary with different types of snow conditions. When snow is very fluffy it may be necessary to follow tracks into adjacent forest areas to find tracks in denser, shallow snow where tracks are more reliable.

Measure wolf tracks and stride; photograph with ruler if uncertain of identification. It would also be useful to measure tracks of other species the first time you encounter them on each survey.

The standard track measurements we would like you to use are shown on the **Measuring Tracks** sheet. In general, take length measurements from the heel to the tip of the longest tow, not including the claws. Please do not use the descriptions of track measurements found in tracking books, as these may differ from ours. If we do not get consistent measurements, this data will be unusable.

Stride is the distance from one footprint to the next place where a print of the same foot appears. It should be measured at the same position on both tracks, for example – from heel to heel.

The first time you encounter wolf tracks, report your observation to your regional coordinator.

Be careful to avoid over counting the number of animals present.

For all species but wolves – all tracks encountered within 0.3 miles of each other should be recorded as one animal.

For wolves – you should follow tracks backward and forward until you can get a good count of the number of animals present. Wolves will often loop around and follow portions of a route more than once, so what appears to be the tracks of 4 animals could be 2 wolves that looped around the same route twice since the last snowfall.

Conversely, wolves may walk single file in deep snow, so what appears to be the tracks of one wolf may represent multiple animals. In either event, you may need to follow tracks a long way before getting a good count. At minimum, follow wolf tracks from the point where they first entered the road to the point where they leave it.

Record any other related sign encountered while tracking.

Note all wolf raised leg urinations (RLU's) and squatting urinations (SQU's). Evidence of blood in the urine should also be recorded. This information is important in determining the territories and reproductive status of wolf packs.

Note any carcasses killed or scavenged by carnivores. If possible, determine the predator involved, the age, sex, and physical condition of the kill.

If you encounter tracks of a rare species

Rare species include Canada lynx, cougar, wolverine, and moose.

Take a photo of the track – be sure to place a ruler next to the track.

Record the location, date, and time – preferably report GPS coordinates (UTM's). When using the tracking app this, information will be documented when you record the tracks.

Report your observation to your regional coordinator or the Rhinelander DNR as soon as possible.

Fill out the rare mammal observation form online and submit it.

Make a mark of the location where the track was encountered on your block map.

If you have problems identifying a track

1. Whenever identification of tracks is uncertain, take photos for later examination. Photos should be taken from directly above the track with a ruler that has visible numbers next to the track.

2. If you are unsure whether a track was made by a wolf or a large domestic dog:

Check the gait. Wolves often place their hind foot directly over the front print when walking, whereas in domestic dogs the hind foot is usually placed to the side of the front print.

Check the travel pattern. Wolves usually walk straight down a road or trail unless they are scent marking. Domestic dogs often exhibit irregular travel patterns.

Dog tracks are often associated with human sign and are often found near residences. However, they do occasionally occur by themselves miles from any house.

If you are still unsure, try using the discriminant analysis form. Directions for using this form are found below.

3. If you are unsure whether a track was made by a wolf or a coyote:

Measure the front tracks. Coyote front tracks are usually 2.8 inches (7.0 cm) in length or less. Wolf tracks are larger.

Measure the stride. When walking, wolf strides measure 33-40 inches (84-100 cm), while coyote strides measure 25-30 inches (64-76 cm).

4. If you think you have found a cougar track, be sure you have not misidentified a dog track.

Check for claw marks. Cougar tracks lack claws, or rarely have narrow, knifelike claw marks. Dog tracks usually have apparent claws.

Check the interdigital (heel) pad. In cougars, the heel pad has 3 similar sized lobes at the back, and the front of the pad is square and/or concave in appearance. The heel pad of dogs will not have even sized lobes, and the front of the pad will be more round and pointed.

5. Measure any small fisher tracks to make sure they are not marten tracks. Although marten are generally much smaller than fisher, large marten tracks may overlap in size with smaller fisher

tracks. You may consider a track to be a small fisher if it is at least 1.6 inches (41 mm) long and 1.5 inches (38 mm) wide.

Using the Discriminant Analysis Form

An example of the discriminant analysis form is included in your packet (page 34). Discriminant analysis can be used to distinguish between wolf and dog tracks by comparing track measurements. Measurements can be taken in the field or from photos or casts you have made. Measurements can be in either metric units or inches.

A list of the necessary measurements is located on the upper left side of the form. These measurements are also illustrated on the backside of the form. Once you have taken all the measurements, use them to calculate shape ratios. A list of these ratios is located directly below the measurement list on the front of the form.

Now look at your decision scales. Here, you are asked to enter some of the ratios you have calculated in order to test whether those ratios are typical of a particular dog breed. Note that you are required to enter a different set of ratios for each breed. Multiply each ratio by the given coefficient. Add the product of each operation to determine the test statistic.

Compare the test statistic to the numbers given for dog, midpoint, and wolf. Repeat this procedure for the other dog breeds. If all the analyses produce test statistics that are closer to that listed for wolf, you can be relatively sure after comparison with only the first 3 dog breeds.

TRACKING ETHICS AND CAUTIONS

Park vehicles on the side of the road in a safe location but be careful to avoid getting stuck in snow covered roadside ditches.

When driving slowly be especially alert for logging trucks.

Don't follow back roads with deep snow cover and generally only conduct surveys using a 4-wheel drive vehicle.

Don't follow wolf tracks for long distances off roads in March and April when wolves are starting to den. This may disturb the animals and/or cause abandonment of den sites.

Avoid disturbing tracks if possible. Others may also be conducting surveys.

Don't follow carnivore tracks on to private land unless you have permission of the landowner.

Don't attempt to howl at wolves on the tracking survey. If you would like to conduct summer howling surveys, please contact us for additional information.

REPORTING YOUR RESULTS

Additional forms can be downloaded from our website or requested from our Rhinelander office.

Send a copy of the track survey form(s) and block map showing your route and location of wolf tracks to your regional coordinator after each survey, or at least monthly. This allows us to monitor which blocks are being tracked and which will need more attention. It also allows us to verify presence of new wolf packs before snowmelt.

Your original track survey forms with block maps and summary sheets are due in at the Rhinelander DNR office April 1st.

FREQUENTLY ASKED QUESTIONS

Why use snow tracking surveys to survey carnivores?

Because carnivores are often secretive and occupy very large home ranges, it is difficult to monitor them by direct observation of the animals. However, we can still estimate the abundance and distribution of carnivores by observing the number and location of their tracks. Other sign that trackers may encounter, such as scat, may be used to make inferences about the animals breeding status or diet. In addition, tracking is relatively inexpensive and allows us to collect more data than would be possible using more expensive methods, such as radio collaring.

Why does the DNR involve volunteers in carnivore tracking?

Budgetary constraints allow us to hire only a few professional wildlife trackers. By involving volunteers in the tracking program, we are able to sample a much broader area than would otherwise be possible. Also, the volunteer tracking program allows more members of the public to be involved in wildlife survey work. We hope that this involvement will allow people to develop an understanding of the important role they play in the conservation of these species.

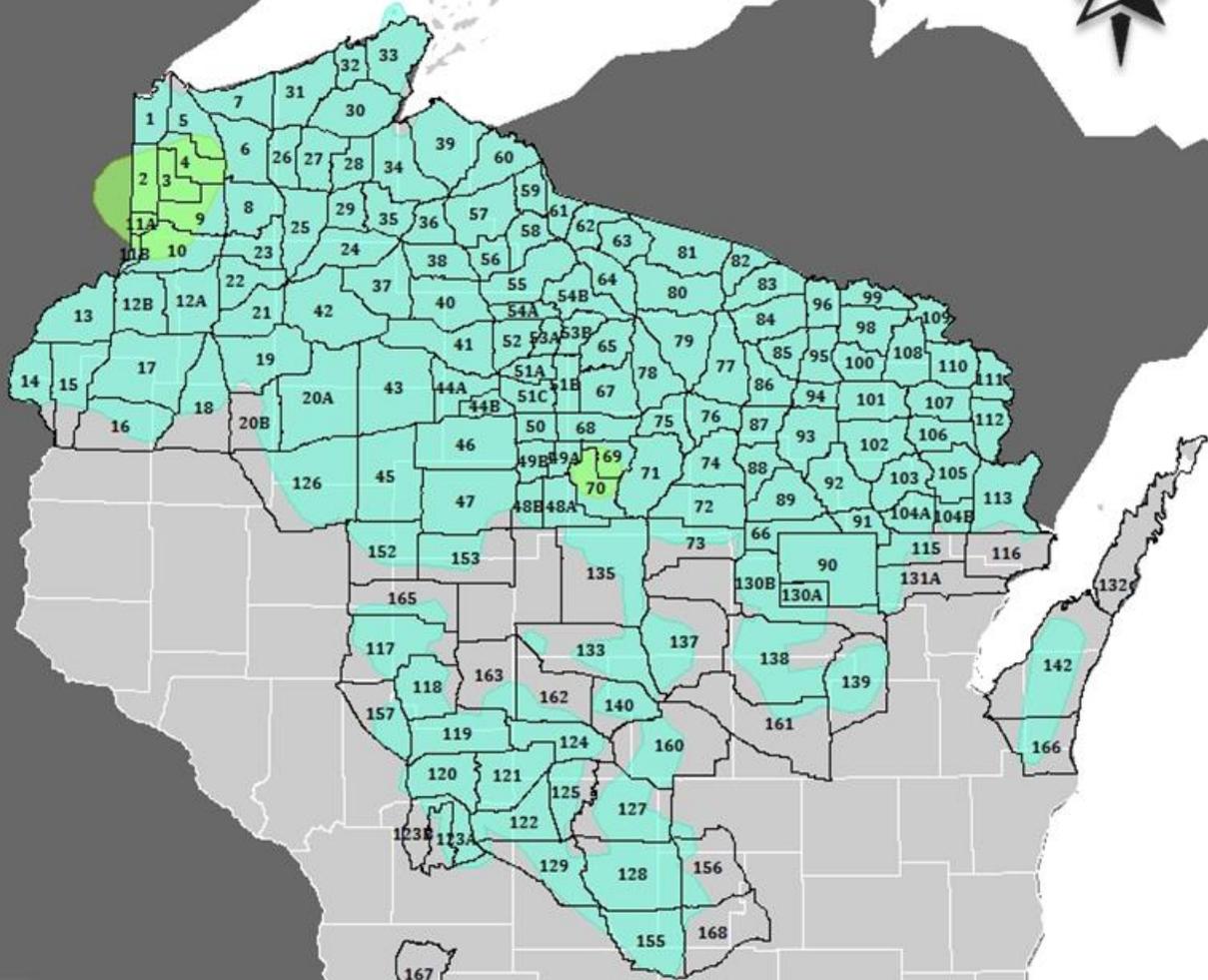
How are the data collected by volunteers used by the DNR?

In a multi-year study, we determined that trained volunteers with at least 40 hours of tracking experience collected data of comparable quality to DNR trackers. Data from trained and experienced volunteers is used in conjunction with other data collected by DNR to determine the overwinter wolf population, wolf distribution, and breeding status of wolves in Wisconsin. Volunteer data is also used to alert the DNR to the presence of wolves in new areas.

Why aren't all carnivore species included in the surveys?

We do not include marten, mink, or weasel as target species because adequate surveys for these species would require careful examination of hare and squirrel tracks as well. Examining these tracks would reduce your ability to adequately survey a large block of land and thus reduce the probability that you would encounter the tracks of larger species. However, while you should not hunt for tracks of non-target species, you should record tracks of these species if you do identify them.

Winter Tracking Blocks 2020-2021 Over the Wolf Range Progression in Wisconsin

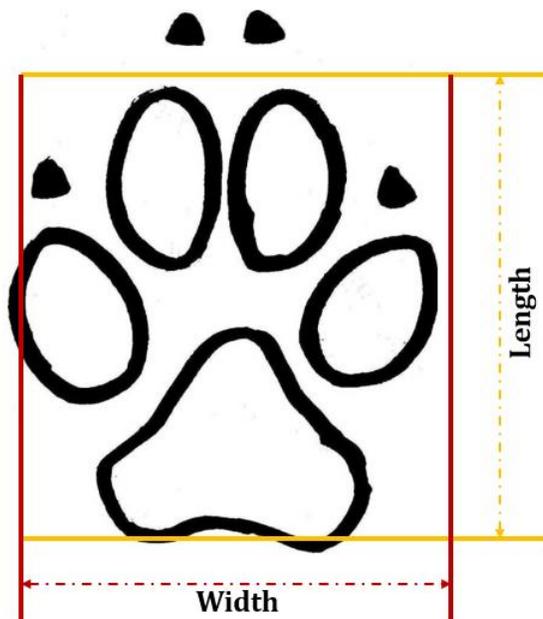


Legend
Yellow Wolf Range 1980
Cyan Wolf Range 2020

0 12.5 25 50 75 100 Miles

MEASURING TRACKS

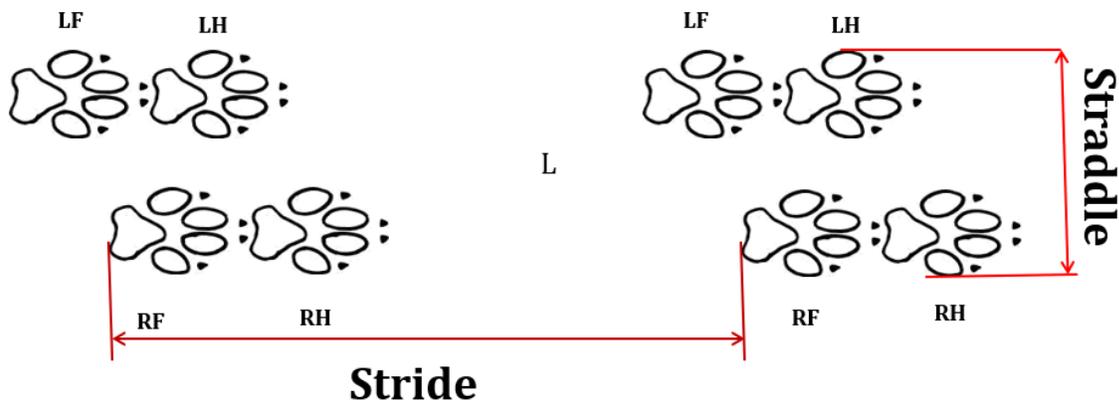
It is important that we use standardized methods for track measurements. Please use the following diagrams as a reference for how to take measurements.



MEASURING GAIT

Stride is the distance between where one foot hits the ground and where that same foot hits the ground next. It can be measured from the front or the back of the track, but should be measured at the same location on each track.

Straddle is the distance between the outside edges of a set of tracks.



GAIT PATTERNS

F = Front foot

H = Hind foot

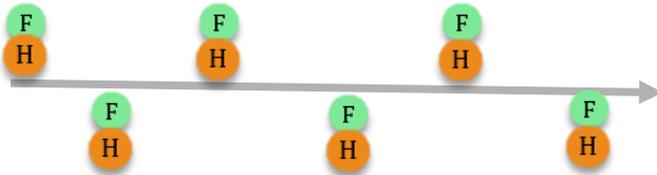
D = Direct registration (hind foot falls directly on top of front track)

Walk

Wild canids often show direct registration and narrow straddle.



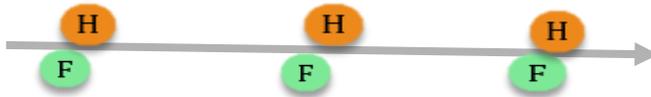
Domestic dogs often show indirect registration and wide straddle (exaggerated below for display purposes)



As speed increases, stride length increases as straddle decreases

2x Trot

often used by wild canids



Roto-gallup

commonly used by domestic dogs



1-2-1 Lope

commonly used by mustelids



CHARACTERISTICS OF TRACKS TARGETED ON TRACKING SURVEYS

Track formulas and measurements are based on information in *A Field Guide to Mammal Tracking in North America* by James Halfpenny, 1986, Johnson Publishing Company, Boulder Colorado.

Group	Species	Toes	Claws	Length / Width	Walking Stride	Common Gait	Notes
Canids (Dogs)	F4 h4 C Track outline usually rectangular, claws usually show, heel pad triangular with convex leading edge; domestic dogs may						
	Gray fox	4	Sometimes don't show	<2" / 1.5"	20"	2x trot	Delicate track, can climb trees
	Red fox	4	Usually show	<2.5" / 2"	25"	2x trot	Chevron shape in heel pad, travel pattern often not in a straight line
	Coyote	4	Usually show	>2.5" / 2"	30"	2x trot	Usually travel in a straight line
	Wolf	4	Usually show	>3.5" / >3"	40"	2x trot	Usually travel in a straight line
	Domestic dog	4	Varies	Varies	Varies	Roto-gallup	Track sometimes roundish; indirect registration - wider straddle; often wander back and forth
Felids (Cats)	F4 h4 Track outline is round; claws usually don't show; heel pad flat or concave on leading edge, 3-lobed on trailing edge.						
	Domestic cat	4	Usually don't show	<2" / <2"	12"	Walk	Often associated with farms or houses, but not always
	Bobcat	4	Usually don't show	>2" / >2"	22"	Walk	Females may have kittens traveling with them in winter
	Lynx	4	Usually don't show	3.75" / >3.75"	28"	Walk	Tracks often indistinct because of extreme hairiness of the foot; when seen, toe and heel pads appear small
	Cougar	4	Usually don't show	3.5" / >3.5"	40"	Walk	Very robust tracks
Mustelids (Weasel family)	f5(4) H5(4) co 1-3-1 toe spacing, but little toe often doesn't show; asymmetrical heel pad, often crescent shaped.						
	Badger	5(4)	Show - very long	2.5" / 2"+		Pigeon toed walk	Very long claws register far in front of the toes.
	Fisher	5(4)	Usually show	2.5" / 2.5"+		1-2-1 lope	Tracks may appear quite large (wolf size) because of indirect registration; look for crescent shaped heel pad, 1-2-1 lope, 5th toe, and zig-zagging back and forth across the road.
	Otter	5(4)	May not show	3.75" / 3.75"+		Bound and slide	May travel away from water at times; look for slides.
Other	Bear	5 (4)	Sometimes show	4.5" / 4" / 7" / 3.5"		Walk	f5(4) H5(4) co Plantigrade; hind track can look like a human foot. Small bear tracks can be confused with cougar; look for toes along top of broad metacarpal pad. Cougar will have toes wrapped around narrower heel pad.
	Beaver	5	Often show	3" / 2.75" / 5"+ / 5.5"		Walk	f4(5) H5 co Tracks rarely seen during winter; webbing between toes of hind feet; tail drag may obliterate tracks.
	Porcupine	F4 H5	Usually don't show	2.75" / 1.5" / 4"+ / 1.5"		Pigeon toed walk	f4 H5 cr Indistinct tracks; often hair or quill drags can be seen; spend a lot of time in trees.
	Raccoon	5	Usually show	2.5" / 2.5" / 4" / 2.25"		Walk	f5 H5 co Indistinct tracks; long, bulbous tipped toes can resemble hand prints; hind tracks often next to front track.
	Skunk	5 (4)	Usually show	<2" / <1.5"		Short spaced walk	f5(4) H5(4) co Plantigrade; tracks look like very small bear tracks; come out during warm periods especially.

CANID IDENTIFICATION

	Wolf	Coyote	Dog
Color	Mix of tan, brown, black, grey and cinnamon on the ears. Several color variations including black and white.	Mix of tan, brown, grey, and some black. Usually lighter than wolves in general, and typically appear more red.	Highly varied but usually not the mix of tan, brown, grey, and black of wolves. Often more solid colors.
Hair	Furry in winter, but coat becomes much thinner and shorter in the warmer months	Furry in winter, but coat becomes much thinner and shorter in the warmer months	Often flat and short, or much fuller and fluffier than a wild canids coat.
Ears	Erect, rounded and furry.	Erect, pointed and furry – much larger in size ratio of head to ears than wolf.	Can be floppy or erect, lack fur in ears.
Head	Large, long, blocky snout, low forehead. Head appears quite square.	Long, pointed snout, low forehead.	Short, blocky snout, high forehead.
Tail	Held flaccid or out straight, no curve.	Held flaccid or out straight, no curve.	Usually curved tail and some curl up over the back.
Precaudal Gland	Black spot on back of tail.	Black spot on back of tail.	Usually no black spot on back of tail.
Chest and Legs	Narrow chest, legs close together.	Narrow chest, legs close together.	Often broad or barrel chest, legs further apart.
Weight (Adult)	50-100 lbs	25-45 lbs	5-150 lbs
Shoulder Height	27-33”	20-22”	10-32”
Total Length	5-6 ft	3.5-4.5 ft	Highly variable.

Please report wolf observations in Wisconsin to the WDNR web site by typing “mammal observation” in the search box. The first link will take you to the Large Mammal Observation form.

Or report to : **Matt Gross**
Wisconsin DNR
101 S. Webster Street
Madison, WI 53703
(608) 261-7588
Matthew.gross@wisconsin.gov

Canid Track Identification

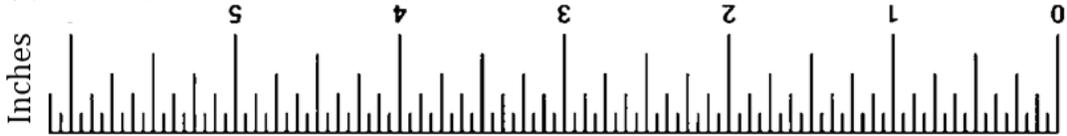
Front Feet Actual Size

Wolves are usually 3.5" or more in length, not including claws.

Coyotes are usually 2.75" in length or less.

Wolves and coyotes generally use direct registration when they walk (hind foot steps in line with front foot). Most dogs do not.

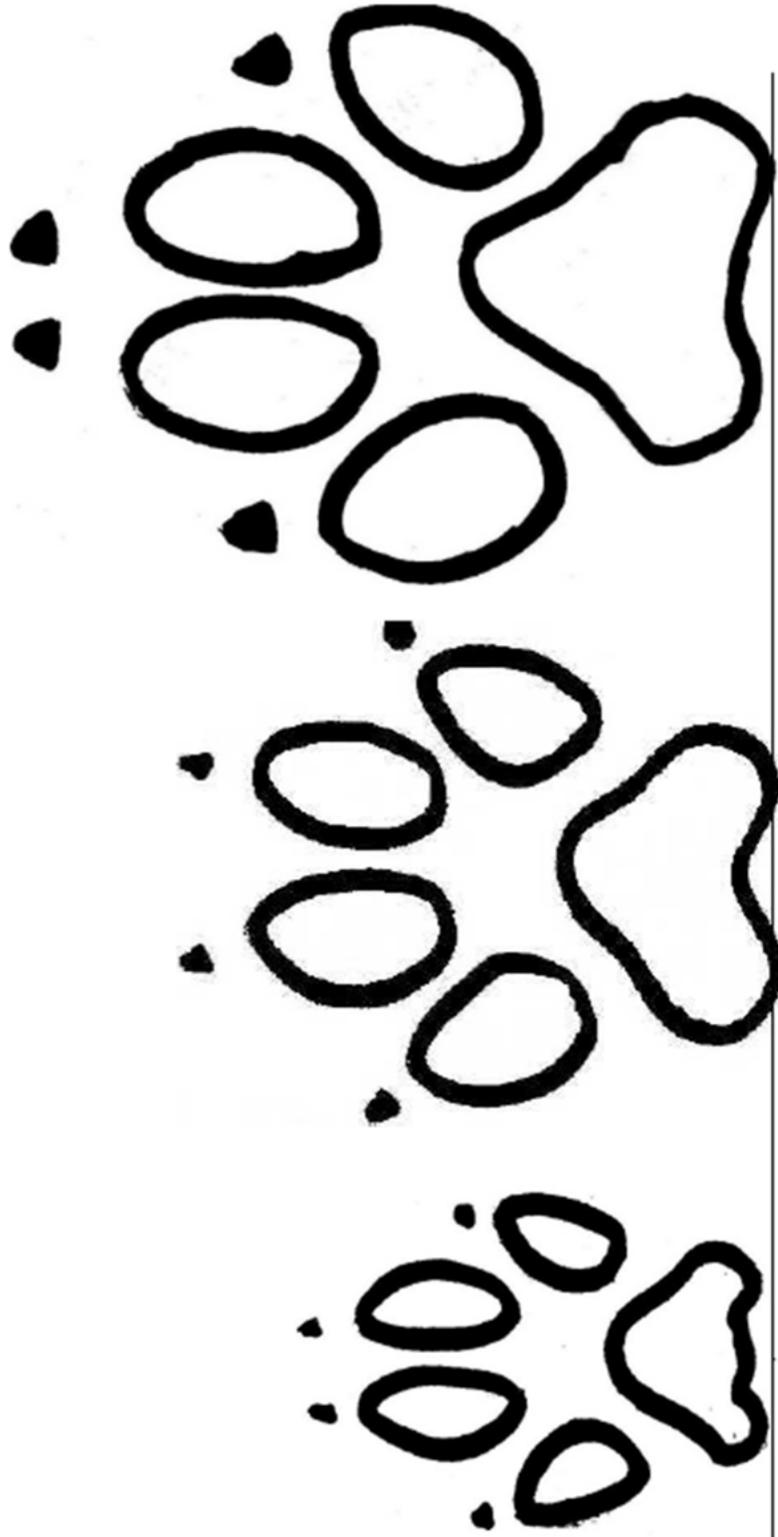
Wolves and coyotes mostly travel by walking and trotting, and usually in fairly straight lines. Dog travel is more variable using a lot of gallops and bounds and often weaving about.



Coyote

Large Dog (highly variable)

Wolf



EXAMPLE

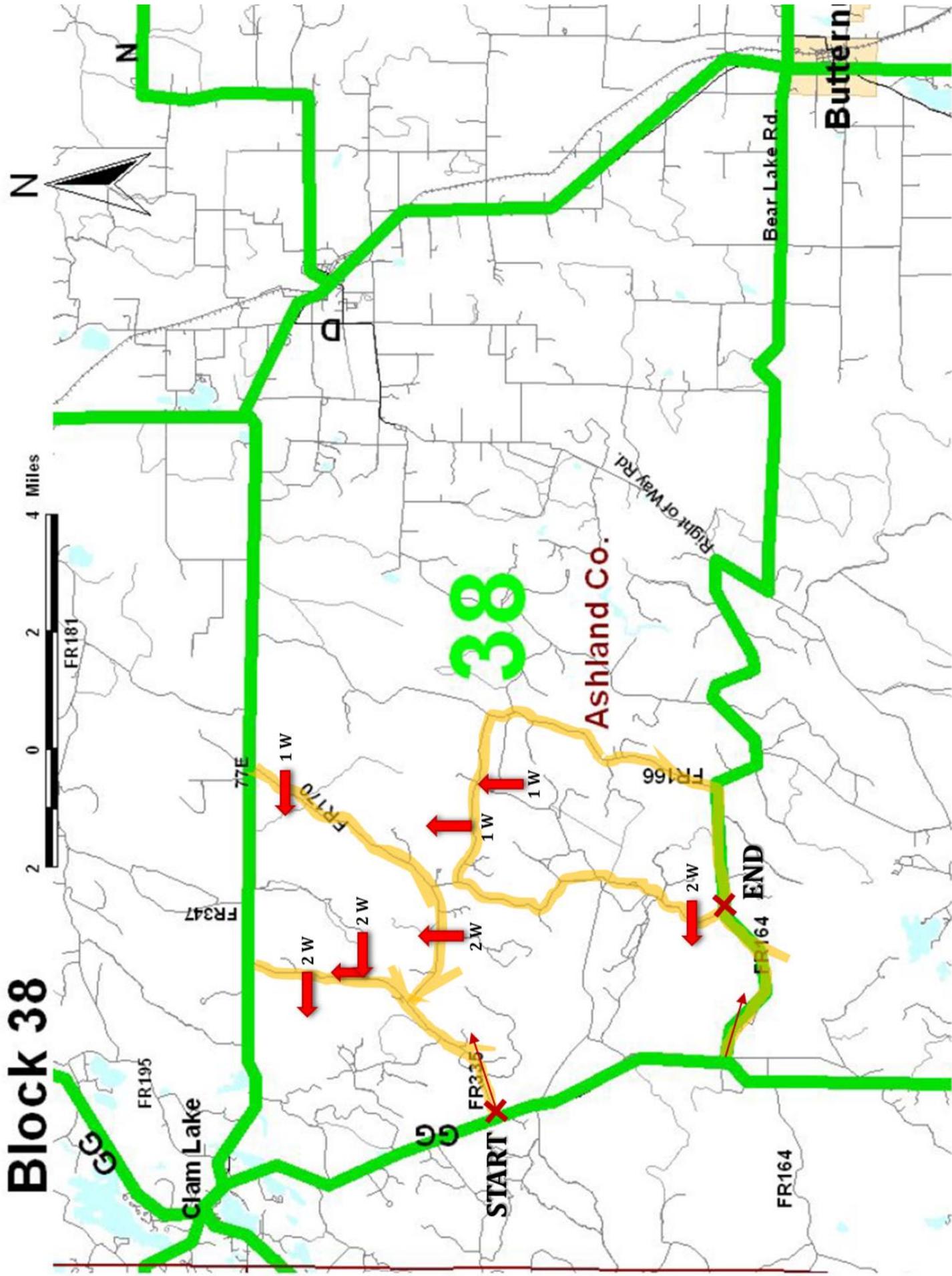
Carnivore Track Survey

Volunteers are an essential part of the Wisconsin Carnivore Tracking Program's success. We appreciate your hard work and dedication. Thank you for participating.

Notice: Use this voluntary form to monitor and report carnivore tracking activities. Information reported to the Department will be used for research and management purposes. Personally identifiable information is not intended to be used for other purposes. Wisconsin's Open Records law requires the Department to provide this information upon request [ss. 19.31 - 19.69, Wis. Stats.].

Observers Shannon McNamara					Sheet <u>1</u> of <u>2</u>	
Survey Information			Weather and Track Information			
Survey Block 38	Counties (all counties tracked) Ashland		Snow Depth 28" total, 2" fresh		New Snow Depth on Road 2"	
Pack Name or General Area Torch River			Temperature 10°	Time of Last Snowfall (record in hours if <48) 48hrs		
Begin Survey (Also indicate on accompanying map)			Cloud Cover <input checked="" type="checkbox"/> 0% <input type="checkbox"/> 25% <input type="checkbox"/> 50% <input type="checkbox"/> 75% <input type="checkbox"/> 100%			
Latitude 46.093090		Longitude -90.871272		Past Weather Hi: 30° Low: 5°		Precipitation (Last 24 hours) 0"
Survey Date 02/01/2020	Start Time 08:00	End Time 15:45	Track Conditions <input type="checkbox"/> Poor <input checked="" type="checkbox"/> OK <input type="checkbox"/> Good <input type="checkbox"/> Excellent			
Canids	C = Coyote	D = Domestic Dog	F = Fox	W = Wolf		
Felids	BC = Bobcat	CT = Domestic Cat	L = Lynx	ML = Mountain Lion		
Mustelids	B = Badger	FI = Fisher	OT = Otter	WR = Wolverine		
Other	BR = Bear	BV = Beaver	P = Porcupine	R = Raccoon	S = Skunk	
Roads and Direction of Travel	Mileage	Canids	Felids	Mustelids	Other	Notes and Comments
GG & FR 335 (N) →	0.0					
335	1.2	1 F				
FR 335 & FR 168 (N) →	2.5					
168	2.8			1 FI		
" "	3.1	2 W	(46.1236/-90.8228)			Enter from E <24hrs
" "	3.7	↓				RLU x2
" "	4.2	1 F				(F 4.5" x 3.75", 4" x 3.8")
" "	4.5			2-3 OT		stride 38"
" "	5.0					TW's exit to W at 3.7
FR 168 & Hwy 77 (E) →	5.2					
Hwy 77 & FR 170 (S) →	8.1					Lots of snowmobile
170	8.3					traffic
" "	8.5	1 W	(46.1505/-90.7522)			Crossed E → W <12hrs
" "	8.8		1 BC			
FR 170 & FR 168 (W) →	11.1					
168	12.2	2 W	(46.1089/-90.8120)			Crossed S → N ~24hrs
FR 168 & FR 335 (S) →	12.5					RLU x2 with BL
Backtrack to GG						
Hwy GG (S) →	15.0					Not Trackable
Totals						

Block 38



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Carnivore Track Survey Instructions

Carnivore Track Survey

Form 1700-052 (R 9/20) Page 3 of 3

Observer(s) - List all observers conducting survey.

Sheet of - Number sheets used per survey block.

Survey Block - Write number of the block you tracked.

County - List all counties in which tracking was done.

Pack Name or General Area - List pack name if known or write general area such "Stevens Lake area".

Date - Date of survey. Time start - Exact time survey starts. Time end - Exact time survey ends.

Snow Depth - Accumulated depth in inches or centimeters. Also give measurements of new snow on road.

Time of Last Snowfall - If less than 48 hours, list hours since last snowfall, otherwise list number of days.

Track Conditions - Check appropriate number

1. Poor: Many prints do not register; identifications are mainly from stride and gait patterns.
2. OK: Most prints register, but often lack detail, may need to follow into woods to identify.
3. Good: Every print registers but many do not show good detail.
4. Excellent: Every print registers and shows good detail.

Temperature - Indicate temperature at start of survey.

Cloud Cover - Check appropriate % cloud cover.

Previous Weather - High and low temperature last 24 hours and any precipitation.

Begin survey - Record the coordinates (in Lat/Long) for the beginning of your survey.

Indicate on map - Mark on accompanying tracking block map where you began the survey and, if possible, the route followed, and where wolf tracks were encountered.

Road Names and Direction of Travel - Name of roads at the intersection when you start and the direction of travel. Indicate road names at all intersections when you enter onto a new road.

Mileage - Set trip meter to 0 at beginning of survey. Record mileage at every identified mammal track, and at every intersection.

Carnivore Groups - Write the initial and number of each mammal track identified under the appropriate columns. **Include arrow-showing direction of travel for wolves on the accompanying map.**

Notes and Comments - Indicate locations of 1st observation of wolf tracks (Lat/Long). Measurements of tracks. Observations of scat, raised-leg urination's (RLU's) or squat (SU), and any blood in wolf urine.

Totals - Summarize total miles surveyed. Total observations of each mammal; if you turn around or had driven twice over any section of road, only count the mileage once. Mammals that follow the road or crisscross will be counted only once unless more than 0.3 miles occur between observations.

The total number of wolves should be your best estimate of the number that you think you encountered based on track size, timing, and direction of travel.

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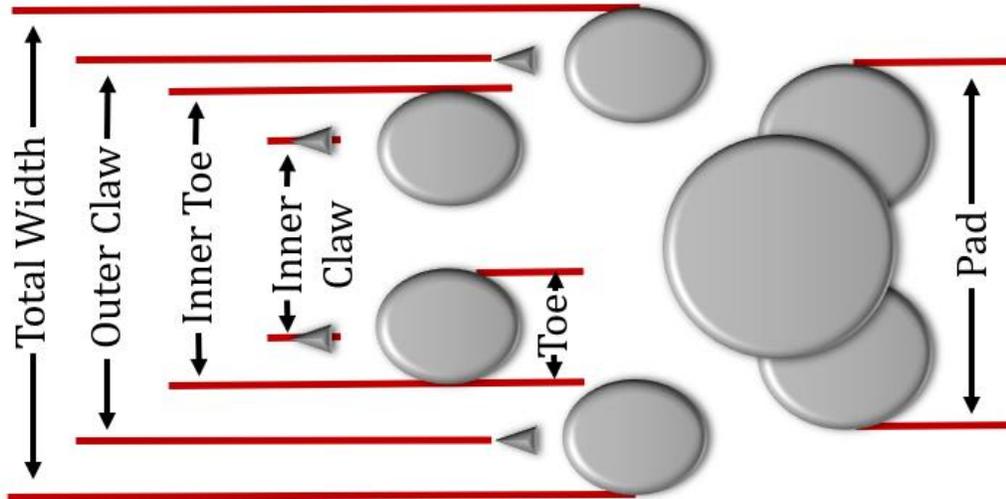
Compiled By	Sample	Date
-------------	--------	------

Measurements		Decision Scales									
cm or mm preferred	Value	Ratio	X	Coefficient	=	Test					
		<i>German Shepard</i>									
A	Claw Length										
B	Total Length	2) E / C	<input type="text"/>	X	0.176	=	<input type="text"/>				
C	Pad Width	3) C / J	<input type="text"/>	X	0.376	=	<input type="text"/>				
D	Total Width	6) F / B	<input type="text"/>	X	-0.482	=	<input type="text"/>	Dog	Midpoint		
E	Pad Length							Wolf			
							TEST =	<input type="text"/>	0.223	0.273	0.322
		<i>Alaskan Malamute</i>									
F	Gap Length	2) E / C	<input type="text"/>	X	0.231	=	<input type="text"/>				
G	Toe Length	4) J / D	<input type="text"/>	X	-0.289	=	<input type="text"/>				
H	Toe Width	5) K / I	<input type="text"/>	X	-0.038	=	<input type="text"/>	Dog	Midpoint		
I	Inner Toe Width							Wolf			
							TEST =	<input type="text"/>	-0.118	-0.104	-0.091
		<i>Bloodhounds</i>									
J	Outer Claw Width	2) E / C	<input type="text"/>	X	-0.064	=	<input type="text"/>				
K	Inner Claw Width	6) F / B	<input type="text"/>	X	-0.652	=	<input type="text"/>				
		7) (G * H) / (E * C)	<input type="text"/>	X	-0.398	=	<input type="text"/>	Dog	Midpoint		
							TEST =	<input type="text"/>	-0.351	-0.319	-0.287
Shape Ratios											
	Value										
		<i>Irish Wolfhound</i>									
1	E / A										
2	E / C	2) E / C	<input type="text"/>	X	0.468	=	<input type="text"/>				
3	C / J	5) K / I	<input type="text"/>	X	0.689	=	<input type="text"/>				
4	J / D	7) (G * H) / (E * C)	<input type="text"/>	X	-0.989	=	<input type="text"/>	Dog	Midpoint		
5	K / I							Wolf			
							TEST =	<input type="text"/>	0.168	0.295	0.422
		<i>Great Danes</i>									
6	F / B	1) E / A	<input type="text"/>	X	0.174	=	<input type="text"/>				
7	(G * H) / (E * C)	2) E / C	<input type="text"/>	X	0.118	=	<input type="text"/>				
		7) (G * H) / (E * C)	<input type="text"/>	X	-1.073	=	<input type="text"/>	Dog	Midpoint		
							TEST =	<input type="text"/>	-0.306	-0.231	-0.156
		<i>St. Bernards</i>									
		1) E / A	<input type="text"/>	X	1.627	=	<input type="text"/>				
		2) E / C	<input type="text"/>	X	-0.157	=	<input type="text"/>				
		7) (G * H) / (E * C)	<input type="text"/>	X	-1.358	=	<input type="text"/>	Dog	Midpoint		
							TEST =	<input type="text"/>	-0.13	0.005	0.139

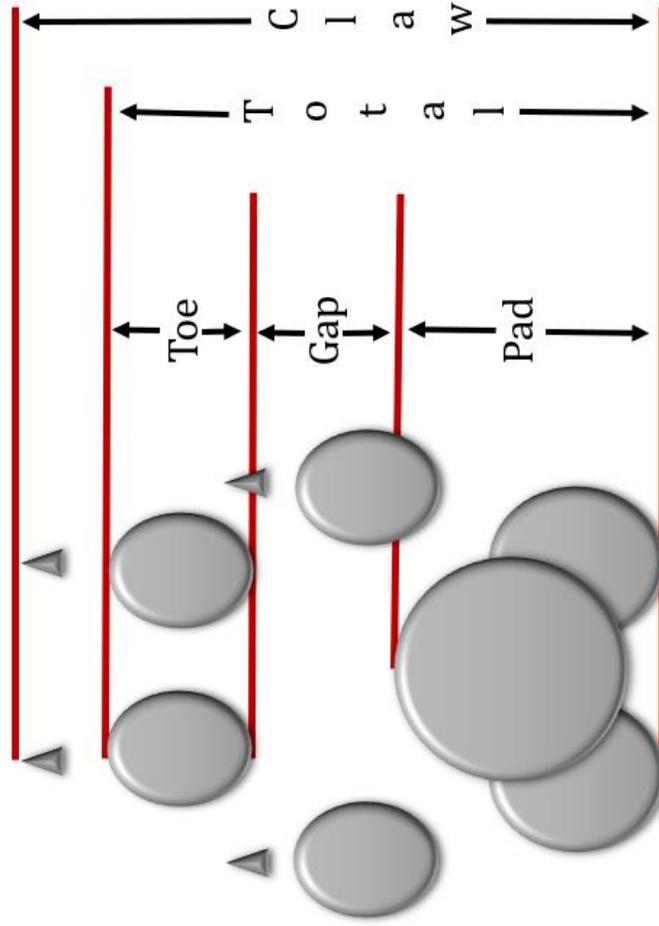
Conclusion:

Harris, R.B. and R.R. Ream. 1983. A method to aid in discrimination of tracks from wolves and dogs in Carbyn, L.N. (ed). Wolves in Canada and Alaska. Canadian Wildlife Service Report Series # 45.

Track Widths



Track Lengths



Digital Carnivore Tracking Survey Field Reference Guide



Use this guide to help you through the process of conducting a tracking survey using your mobile device. Make sure you also have a hardcopy map with you to fill out throughout the survey. At this point you should be in the field and parked at your start point.

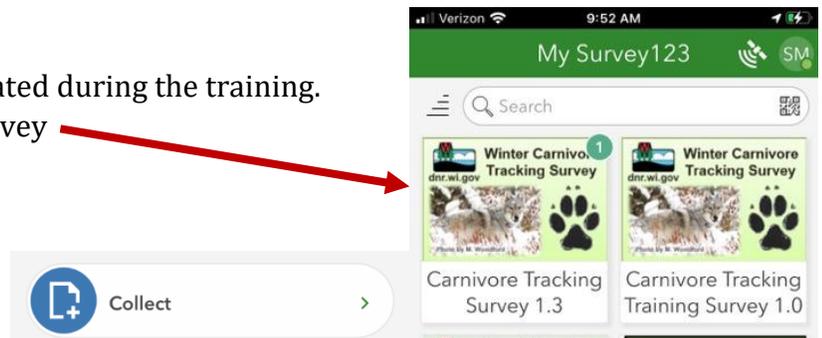
Step 1:

Get logged into your account using the following format for your username: “dnrhub.” – first initial – last name all lowercase

- Ex: dnrhub.nkluge
- Use the custom password you created during the training.

Step 2: Select the Carnivore Tracking Survey

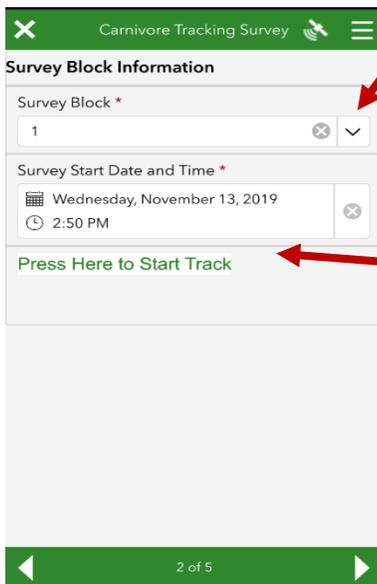
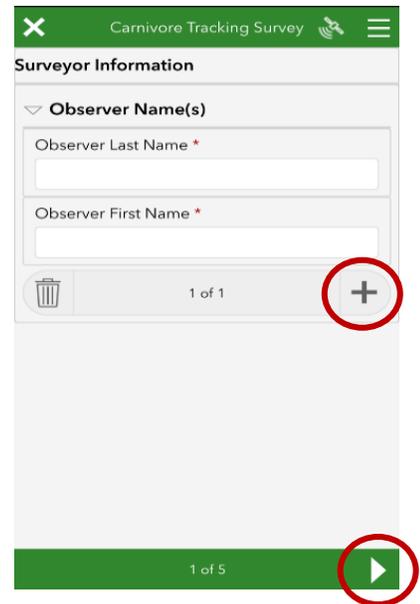
Step 3: Select “Collect” at the bottom



Page 1 of 5

Step 4: Record your **Last Name** then your **First Name** – Press the **“Plus”** button to add another observer – Press the **“Next”** arrow at the bottom right corner

Page 2 of 5



Step 5: Select the **block** in which you are tracking

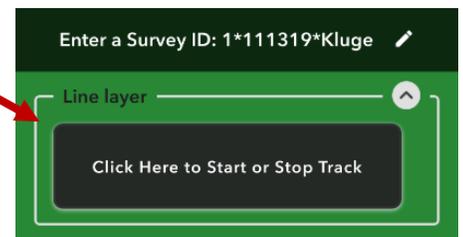
Step 6: The current date and time will **automatically** generate

Step 7: Select the **“Press Here to Start Track”** link
-This link will bring you over to QuickCapture

Step 8: Select **“Click Here to Start or Stop Track”**

Actively tracking when this button is flashing

Step 9: Navigate back to **Survey123** and select the **“Next”** arrow at the bottom right of your screen



Page 3 of 5

Step 10: Fill out **past** weather data, if known (can be filled out later and resubmitted)

Step 11: Fill out **current** weather and snow Conditions (required*)

- Snow Depth = total accumulation in woods
- If over maximum, select max # and write the actual in comments at the end

Step 12: DO NOT SELECT NEXT BUTTON UNTIL YOU COME TO YOUR FIRST TRACK

Page 4 of 5

Step 13: If at any point you need to turn around and back track or travel along an un-trackable section – Select the “**Press Here to Pause or Resume Track**” (This will take you over to QuickCapture)

Step 14: Select the flashing button – **Stay in QuickCapture** until you get back onto a trackable section – **re-select** the button so that it is flashing – **Return to Survey123**

Step 15: Select “Compass” to update location to current (This will automatically happen from now on once you select the “Plus” button, but make sure you are at the location to want to record the data)

Step 16: Take a picture if ID confidence has any doubt

Step 17: Select the species you are observing and Indicate the number of individuals

Step 18: **DO NOT SELECT THE “PLUS” BUTTON UNTIL YOU GET TO YOUR NEXT WAYPOINT**

Step 19: For Wolf Observation - record
- “Observation Type” or select “None”
- Record “Direction of Travel”

- **Cross** – Simply crossed the road without traveling down the road
- **First** – The wolf is traveling along the road
- **Continued** – to capture data while still recording wolves traveling on the road (changing “observation type”, more wolves join, some wolves leave)

- **Last** – Wolves that were traveling down the road have now all left

Step 20: After all observation have been recorded in the app and on your hardcopy map and you have reached your end point – Select the “Next” button

Page 5 of 5 – You are now at your end location

Step 21: Indicate total number of each species recorded
(Reference hardcopy map tally)

Step 22: Indicate counties tracked in and overall Tracking Conditions

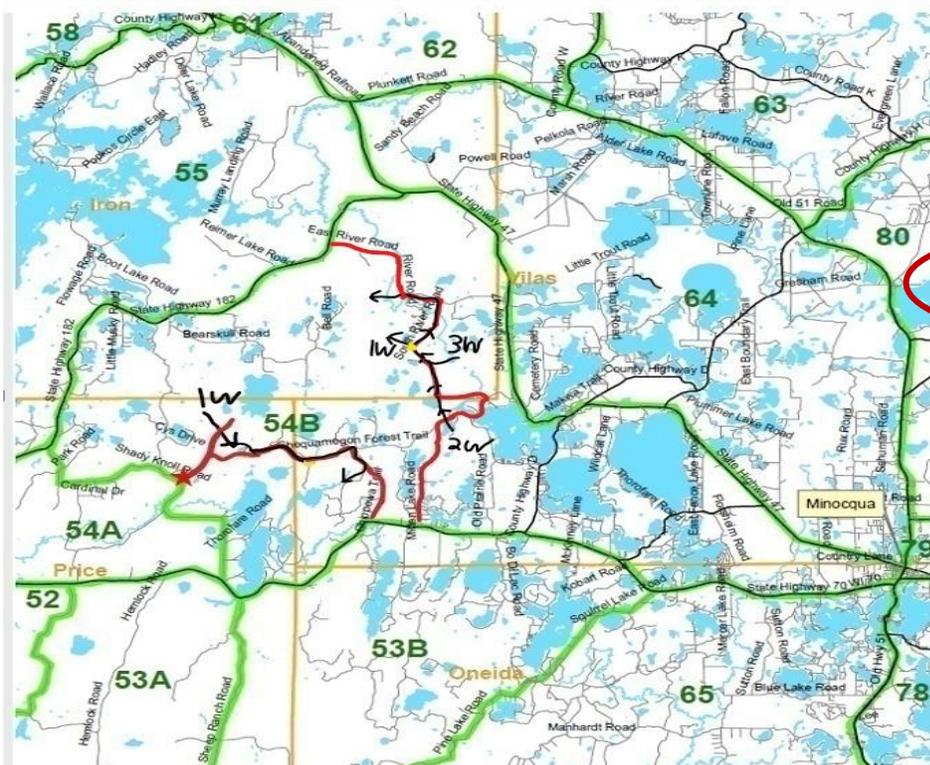
Step 23: Press on the **time** and it will autogenerate the current time

Step 25: Complete your hardcopy map and **attach photo**

- Trace route
- **Tally non-wolf species** on side or back of map
- Show travel directions and number of wolves
(ONLY FOR WOLVES)

Step 26: **SELECT “PRESS HERE TO END TRACK”** – Press the flashing button to stop tracking – **Return to Survey123**

Final Step: Select the “Check” to submit survey - Always select “Send Later” unless you have stable cellphone service or are connected to wifi. The survey will be saved to your “Outbox” where you can access at any time in the future. You can also edit it to add in the previous days weather or anything else you want to change.



Wisconsin Carnivore Survey Blocks

Block 54B

Vilas, Iron, Price, & Oneida Counties

Fox *Fisher*
1 1



Map created November 2015
WDNR