

Appendix IV. Carnivores - Multi-species Baseline Initiative

Lucid, M.K., L. Robinson, and S.E. Ehlers. 2016. Multi-species Baseline Initiative project report. 2010-2014. Idaho Department of Fish and Game, Coeur d'Alene, Idaho, USA.

Appendix IVa: Protocols, Datasheets, Supply Lists, and Whitebark Pine Field ID Guide

Multi-species Baseline Initiative (MBI) Forest Carnivore Bait Stations: Protocols for Setup, Rebait, and Removal

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BAIT STATION SETUP

Choose a Station Location

Within each survey cell, bait stations should be located in places likely to be frequented by forest carnivores. Choose sites where carnivores are likely to travel, including saddles, heads of drainages, ridges, and drainage bottoms.

Once the general area for the bait station is chosen, pick a location that has good exposure to wind for distributing scent or is located along a likely travel route for animals. Place stations at least 50 meters from any road or snowmobile trail and avoid areas likely to be used by winter recreationists. Carnivores may become habituated to the bait station location. For that reason, do not place bait stations near any human dwelling or structure (even if it is not in use during the winter) nor near any road that may be heavily used in the summer. Avoid other areas of high summer use such as camp grounds and popular trailheads.

Choose a Bait Tree and Camera Tree

Trees should be:

- 9 to 11 feet apart from each other (measure the distance between the camera and bait trees).
- >12" diameter.
- Alive.
- NOT Whitebark Pine!
- Bait tree should not have neighboring trees within 4 feet (to prevent animals from jumping on the bait from a nearby tree instead of climbing the bait tree).
- Waypoint the camera tree. Use the WGS84 datum and decimal degree format (e.g., 48.1234, 116.12345).

Site Prep

- Remove all brush or small trees in between bait tree and camera tree that may inadvertently obscure the camera or trigger the camera when blown by the wind.
- Remove any branches near the bait (above or below) that might allow animals to “rest” on them.



Fisher resting on an improperly prepared bait tree. Notice how the fisher is resting on the branch well above the gunbrushes. These branches should have been removed upon set-up.

- Remove any branches above the camera that might collect snow and droop into the field of view, thereby obscuring pictures.

Wire Bait to the Bait Tree

- Any wild game meat can be used for bait. A front or hind quarter of a roadkilled ungulate works well. We prefer beaver carcasses. Frozen adult beavers can be cut in half easily with an axe. Juvenile beavers can be used whole. 10-15 pounds of meat is a good bait size.



SKIN YOUR BAIT! Un-skinned bait will result in ungulate or beaver hair spread all over your gunbrushes, contaminating your forest carnivore DNA samples!

- Use a 12” spike or a power drill to make four holes in the beaver carcass or bait: 2 on either side of the spinal column (or bone) about 3-4” apart.



- Wrap wire through these 4 holes and around the spinal column several



times.

- Use a spike or screwdriver to tighten the wire around the carcass- especially if you are wiring it when it is frozen (as the meat thaws, the wiring will loosen up).
- Leave wire tails 3-4 feet long on both ends of the wire.

Hint: wire your beaver *before* heading out in the

- Place bait 6-7 feet off the ground facing the camera tree (remember, it will snow more!).
- Place a large nail in the carcass or tail to hold the beaver up while you wire it to the tree.
- Place another large nail on the backside of the tree at the same height as the bait.
- Place 2 double headed nails on either side of the beaver about 4 inches away from the bait at the top and bottom of the bait (for a total of 4 nails).
- Take the tails of the wire and wrap them around the tree, wrapping the wire around the nails in the tree.
- Wrap 2-3 more long pieces of wire around the whole carcass, using the nails as anchor points. Try to create several angles of wire around the bait so that the carcass is VERY securely attached to the tree.
- Use a fencing tool to tighten the wire around the bait by creating loops in the wire in several spots.



Notice the well constructed 'harness' on the left hand beaver which will keep it attached to the tree as mustelids attempt to remove the carcass. However, this beaver's tail has obviously not been 'nailed' to the tree. 'Nailing the tail' often results in the tail being left behind after a mustelid does remove the carcass. On the right a fisher comes back to a tree to try and retrieve a tail. A combination of securely wiring the beaver to the tree and 'nailing the tail' makes the bait station effective for the longest time period possible.



Make sure you point the narrowest end of the bait up. This 'front half' of a beaver should have been oriented facing up the tree so there wasn't a nice resting platform for this bobcat. The goal is to force the animal to spend time touching the gunbrushes.

Attach the Gunbrushes and Accessories to the Bait Tree

- Use a short wood screw to attach 12 connectors (terminal lugs) to the bait tree.
- Connectors should be placed in two rings (6 connectors per ring) below the bait.
- The first ring should be 12" below the bottom of the bait.
- The second ring should be 18" below the bait.
- Connectors in the two rings should be offset so that no connectors are directly above or below another.
- Connectors should NOT be placed directly underneath the bait or anywhere where the bait will likely drip on the gunbrushes (causing contamination of the DNA sample).
- Orient the connectors so that the tab (screw side) is facing down.
- Make sure the connectors are firmly in place and do not swivel.
- Once the connectors are in place, use the screw in the connectors to attach the gunbrush to the connector.
- Use latex gloves or bare hands to handle the gunbrush. Fleece or wool gloves are more likely to have hairs pets or humans stuck to them which could contaminate the DNA samples.
- Make sure the gunbrush is firmly attached, but do not over tighten the screw as it can rust in the elements and become difficult to unscrew during station removal.
- When gunbrush is in place, bend it forward so that the brush is oriented at a 90 degree angle to the trunk of the tree. Make sure not to damage the bristles of the brush when you bend it.



Orient connectors so the side with the tab faces up. Insert the gunbrush from above. This reduces your chance of dropping it in the snow when you take it down.

- Use a lighter to sterilize each gunbrush for at least 5 seconds.
- Move the lighter up and down the gunbrush. This destroys any DNA that may be lingering on the brush (this is especially important if you own a cat!).

- Attach the criminal tape to the bait tree with two staples. Rope should extend at least 6” above the top of the bait and should be in view of the camera.



The 'criminal tape' is a rope with reflective tape wrapped around it every 12 inches. This helps give a size estimate for difficult to identify animals.

- Attach station sign to bait tree with a double headed nail. Sign should be placed about 6 inches below the bait and should be labeled with the station ID (“W” plus cell #).



The station sign should have large, easily read, block letters.

Hang Gusto Sponge

- Before heading out to the field, soak sponges in gusto and a little water (to moisten sponge).
- Transport gusto sponge to the field in a ziploc bag.
- At the bait station, poke the end of a 2 foot long piece of annealed wire through the middle of the sponge.
- Choose a place to hang the sponge that will facilitate the spread of scent from the lure (e.g., open areas, areas higher up that will catch the wind). The sponge should be located within 50 feet (preferably within sight) of the station.
- Wrap the wire around the sponge.
- Hang the other end of the wire from a nearby tree as high as you can reach.

- Flag the tree or branch with the sponge on it so that it can be recovered when the station is removed.

Set up Camera Tree

- Use lock or bungee cord to attach the camera to the camera tree at the same height as the bait.
- Point the camera toward the bait. If necessary, shove small sticks behind the top or bottom of the camera to get the view angle right.
- If needed, shove sticks in between the lock and the tree to prevent the lock from slipping down the tree.
- Use the 'walktest' function on the camera to make sure that it is oriented correctly and that it will trigger when animals approach the bait.
- If using a Reconyx PC800 or PC900, camera settings should be as follows:
 Under Main Menu>Change Setup>Advanced>Trigger>:
 Motion Sensor: ON
 Sensitivity: High
 Pics Per Trigger: 3
 Picture Interval: Rapidfire
 Quiet Period: No Delay
 Main Menu>Change Settings>Advanced>
 Resolution: 3.1 MP
 Night Mode>Night Mode: Balanced
 Night Mode>Illuminator: ON
- Use an 8GB memory card or larger.
- Use NiMH batteries and make sure this is reflected in the main menu>battery type (if this option is present).
- Arm the camera and take several pics of you walking toward the bait.
- Use a handheld digital camera to review the pics and make sure you have the right field of view.



This camera has a poor field of view. It should be aimed lower so the entire bait and the ground are captured in the image.

- Field of view should include 6-12” of space above the top of the bait, but not much more than that as you will not be able to see animals that do not climb the tree but do approach the bait (wolves and coyotes).



This camera has a proper field of view which allows capturing images of non-tree climbing animals like this coyote.

- Erase test pics from card.
- If using a lock, make sure to record the key# and remove the key from the lock.
- **Arm the camera!**
- Make sure to record at least one picture of yourself (hand wave in front of the camera is fine) before you leave the station so that we have a record of when the camera was set.
- Before leaving the site, make sure you have recovered all tools and gear from the ground.

BAIT STATION REBAIT

- Make sure to record at least one picture of yourself (hand wave in front of the camera is fine) so that we have a record of when the station was rebaited.
- Turn off the camera.
- Replace memory card and batteries.

Sample Collection

- Examine each gunbrush closely for hair
- Only collect gunbrushes that have visible hairs present (not lichens!)



Hint: To help see hair, put an envelope behind the gunbrush.

- Label sample envelopes with:
 - Sample ID: W, cell number, sample letter (A-L), V, visit number (The first visit is the setup. There will be no samples ending in V1)
 - (Example: The fifth gunbrush collected on the third visit to cell 125 will be called **W125EV3**)
 - Observers
 - Date
 - Waypoint in decimal degrees latitude/longitude (WGS84)
 - Cell #
 - Sample type= FC bait station
- Use a screwdriver to loosen the screw holding the gunbrush in place
- Without touching the gunbrush, cover the gunbrush with the sample envelope and remove the gunbrush (inside the envelope) from the connector. You do not have to collect the samples in any particular order.
- Place all sample envelopes in a Ziploc bag.
- Once home for the day, take samples out of the Ziploc bag and spread them out to dry. Moisture can cause the envelopes to rip and can damage DNA! Be sure to keep pets away from your samples, drying them in a drawer works great and keeps pet hair away from them.

Replace Gunbrushes and Bait

- Place new gunbrushes in the connectors that you removed samples from. See protocols in the station setup section. Gunbrushes that did not have hair on them should be left untouched.
- Replace the bait. See protocols in the station setup section.
- **Re-arm the camera!**
- Make sure to record at least one picture of yourself (hand wave in front of the camera is fine) before you leave the station so that we have a record of when the camera was reset.
- Before leaving the site, make sure you have recovered all tools and gear from the ground.

BAIT STATION REMOVAL

- Make sure to record at least one picture of yourself (hand wave in front of the camera is fine) so that we have a record of when the station was removed. Be sure to keep pets away from your samples, drying them in a drawer works great and keeps pet hair away from them.
- Turn off the camera.

Sample Collection

- Examine each gunbrush closely for hair.
- Only collect gunbrushes that have visible hairs present (not lichens!).
- Label sample envelopes with:
 - Sample ID: W, cell number, sample letter (A-L), V, visit number (The first visit is the setup. There will be no samples ending in V1)
 - (Example: The fifth gunbrush collected on the third visit to cell 125 will be called **W125EV3**)
 - Observers
 - Date
 - Waypoint in decimal degrees latitude/longitude (WGS84)
 - Cell #
 - Sample type= FC bait station
- Use a screwdriver to loosen the screw holding the gunbrush in place.
- Without touching the gunbrush, cover the gunbrush with the sample envelope and remove the gunbrush (inside the envelope) from the connector. You do not have to collect the samples in any particular order.
- Place all samples in a ziploc bag.
- Once home for the day, take samples out of the Ziploc bag and spread them out to dry. Moisture can cause the envelopes to rip and can damage DNA!

Remove Hardware and Camera

- Use fencing tool to remove all wire and bait from the bait tree.
- Toss remains of bait into the woods. Make sure there is no wire left in the bait that you toss in the woods.
- Remove all connectors, station sign, criminal tape, and nails from bait tree.
- Remove camera.
- Remove gusto sponge and all flagging.
- LEAVE NO TRACE! Make sure ALL hardware and gear is removed from the station site.

This is an example of a bait station set up correctly. The camera is placed 9-11 feet from the bait to allow for a full field of view. This view goes from about 6 inches above the bait to the ground. Seeing the ground is important to capture images of non-tree climbing animals such as coyotes and wolves. Notice how the bait tree stands alone like a pole. There is nothing obscuring the view and no other way for animals to get to the bait other than climbing the tree.

Tail nailed to tree

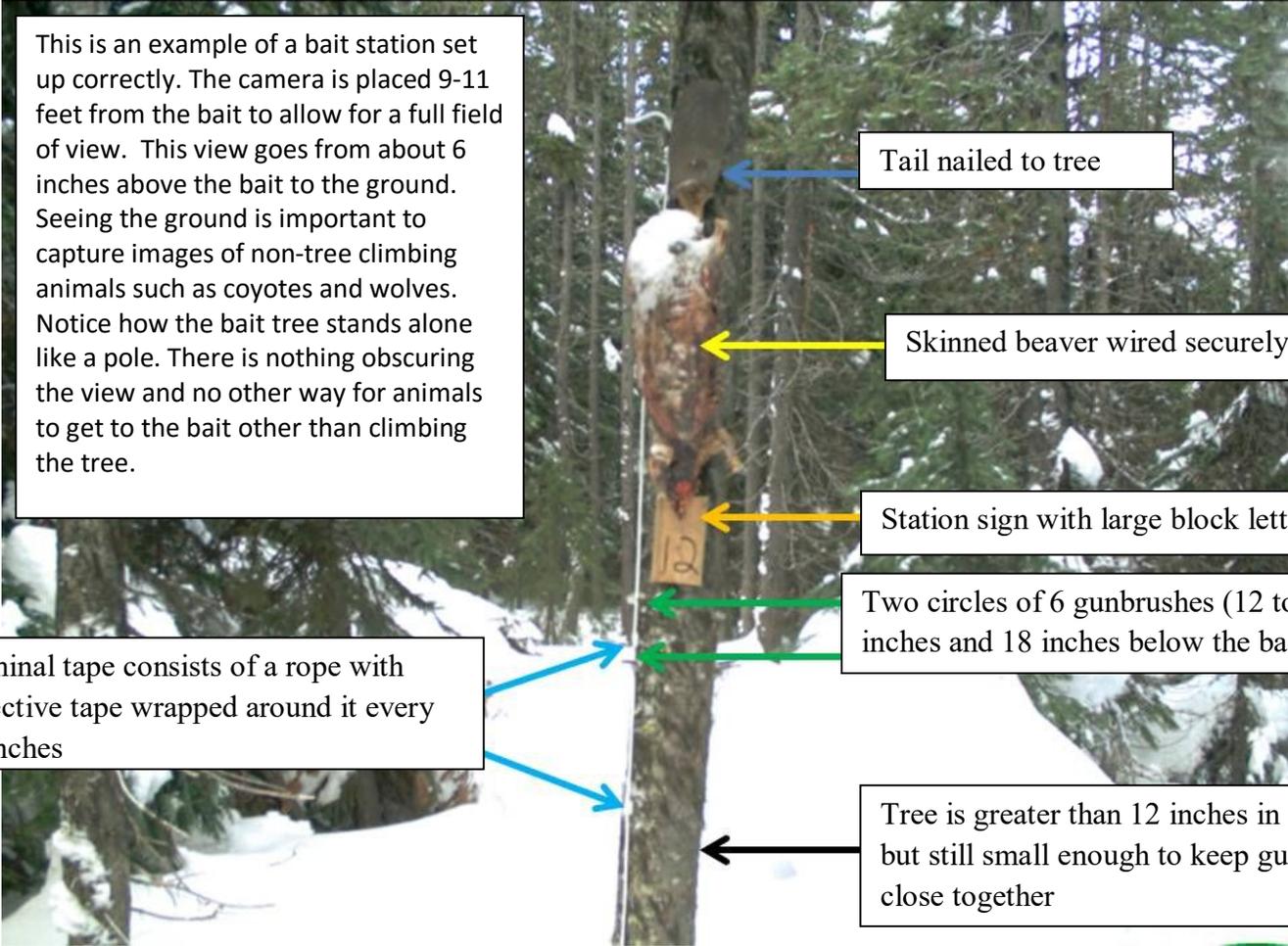
Skinned beaver wired securely to the tree

Station sign with large block letters

Two circles of 6 gunbrushes (12 total) 12 inches and 18 inches below the bait

Criminal tape consists of a rope with reflective tape wrapped around it every 12 inches

Tree is greater than 12 inches in diameter but still small enough to keep gunbrushes close together



IDFG training video can be found at:

http://www.youtube.com/watch?v=b_D0XsTKWn4&feature=youtu.be

Forest Carnivore Bait Station Setup

Station (W,Cell#): _____

Observers: _____

Date: _____

Lat: _____ **Long:** _____

Datum: _____

Distance between bait and camera trees (96-144 inches): _____ **inches**

Camera model: **ReconyxRM45** **ReconyxRC55** **ReconyxPC800** **Other** _____

Camera serial number: _____ **Camera lock key number** _____

- Pick bait tree (≥ 12 " diameter), apart from other trees (so animal can only access bait from bottom).
MAKE SURE BAIT AND CAMERA TREES ARE **NOT** WHITEBARK PINE!!!!
- Pick camera tree 8-12' from bait tree. Make sure camera tree is small enough so lock will fit around it.
- Measure and record distance between camera and bait tree in inches.
- Take waypoint of camera tree in WGS84, average 80 time if GPS allows.
- Remove all 'resting' branches from bait tree.
- Remove any branches on both trees which may potentially block camera view or trigger camera.
- Wire beaver securely to bait tree (bottom of beaver 6' off ground) - nail the tail!
- Screw 12 gunbrush holders to bait tree in two concentric circles.
First circle will be 12" below beaver, second circle 18" below beaver.
Do not place gunbrush holders directly below beaver (so blood doesn't drip on gunbrushes).
- In each holder, place one gunbrush from above and tighten.
- Attach criminal tape to bait tree, in view of camera, extending from beaver to snow.
- Nail station name placard below beaver.
- Confirm memory card and charged batteries are in camera.
- Lock camera to tree making sure camera is at same height as beaver.
- Remove key from lock and record key number.
- 'Walktest' camera.
- Flag camera tree (do not block camera view!).
- Hang and flag gusto sponge (≤ 10 meters from bait).

Forest Carnivore Bait Station Follow-up Visit# _____ Station (W, Cell#): _____

Observers: _____ **Date:** _____

Bait status (circle one): untouched partially consumed skeleton all gone

Action taken (circle one): station removed station re-baited

Camera batteries replaced (circle one): yes no

Sample IDs: _____

SAMPLE CARE: As soon as you are out of the field take all envelopes out of Ziploc bags. Lay them out where they will dry and will not be accessible to pets. A drawer works great. **SAMPLES NEED TO BE DRY FOR DNA TO REMAIN VIABLE.**

DO NOT EVER TOUCH DNA SAMPLES!!

IF RE-BAITING STATION:

- Turn off camera.
- Replace batteries if level is below 80%.
- Replace memory card.
- Examine each gunbrush closely for hair.
- Without touching hair, place each gunbrush with hair in a separate envelope (1 per envelope) and label:
W, station number, sample letter (A-L), V, visit number
Example: The fifth gunbrush collected on the third visit to station 25 will be called: **W25EV3**
The first visit is the setup. There will be no samples ending in V1.
- Seal all envelopes in a Ziploc bag (one Ziploc per station).
- Replace gunbrushes taken as samples with clean gunbrushes, leave gunbrushes with no hair untouched.
- Account for all 12 gunbrushes.
- Hang new beaver.
- Re-arm camera!!**

IF REMOVING STATION:

- Collect and name samples as above.
- Place gunbrushes without hair into a Ziploc bag. Return these for cleaning.
- LEAVE NO TRACE:**
 - remove all hardware and flagging from tree
 - collect gusto sponge and flagging.
 - remove all wire from beaver carcass before discarding in woods.

Bait Station Supplies and Tools Needed:

Part	Cost	Number Needed	Total Cost	Source
.30 caliber rifle brush	0.75	12	\$9.00	ATK Security and Sporting
14-2 ALCU Terminal Lug	0.73	12	\$8.76	Idaho Electric Supply
sample envelope	0.08	12	\$0.96	envelopesuperstore.com
wood screw		12		
criminal tape	.08/ft	6	\$0.48	
large staples		2		
large nail		1		
contractor bag	0.5	1	\$0.50	
station sign		1		
sponge	0.46	1	\$0.46	buythecase.com
gusto				Minnesota Trapline Products
form/annealed wire				
flagging				
1/2 beaver	6	0.5	\$3.00	
Total			\$23.16	

Tools Needed:

Phillips head screwdriver
 Flathead screwdriver
 Fencing tool
 Hammer
 GPS unit
 Data sheet
 Pencil/pen
 Bait gloves
 Measuring tape
 Folding brush saw

WHITEBARK PINE IDENTIFICATION

Whitebark pine (*Pinus albicaulis*) is a candidate for listing under the Endangered Species Act. The U.S. Fish and Wildlife Service has directed Multi-species Baseline Initiative partners to mitigate any potential harm to individuals of this species by instructing field personnel (this includes employees and volunteers) as follows:

DO NOT ATTACH HARDWARE (screws, beavers, cameras, etc) **OR OTHERWISE ALTER WHITEBARK PINE TREES** (cut branches etc).

Whitebark pine is typically found at higher elevation sites. Young whitebark pines have greyish white to chalky white bark while older trees have brown scaly plates with narrow fissures. Whitebark pines can be confused with Lodgepole pines (*Pinus contorta*) or Western White pine (*Pinus monticola*). Cones and needles are the best way to tell the two species apart.

Count the number of needles per fascicle:

Whitebark pines have five needles per fascicle (bundle), which range in length from 2- 3 inches. If there are fewer than five needles per fascicle, then the tree is not a Whitebark pine. Lodgepole pines have two and sometimes three needles per fascicle, so this is a good way to distinguish between the two species.

If there are five needles per fascicle:

The other trees species in Northern Idaho that has five needles per fascicle is Western White pine, whose needles tend to have a blue-green appearance and range in length from 2-5 inches. Whitebark pine is most easily distinguished from Western White Pine by its cones, which are MUCH smaller (2-3 inches long) than those of Western White pine 5-10 inches long).

Whitebark Pine	Lodgepole Pine	Western White Pine
Cones: Small 2-3 inches long , broadly ovoid, purplish brown when mature, blunt triangular tips that lack prickles	Cones: Small 0.5-2 inches long , asymmetrical and lop-sided, cylindrical with prickles	Cones: Large 5-10 inches long , slender and slightly curved, flat and lack prickles, hanging
Needles: Bundles of 5 , stiff, dull to bluish green, 1-3 inches long	Needles: Bundles of 2 , yellow green, stiff and twisted, 0.5-3 inches long	Needles: Bundles of 5 , thin, soft, bluish green, 2-5 inches long



Photo: Richard Sniezko, USFS



Photo: USFS



Photo: BC Ministry of Forestry

IF IN DOUBT, CHOOSE ANOTHER TREE!