Adapted-Hunt Drift Fence Technique (AHDriFT) Construction and Deployment Instructions

Evan Amber, Gregory Lipps and William Peterman
Adapted from: Martin et al., *Wildl. Soc. Bull.*, 2017

Camera Trap Housing Unit Construction (build three units per Y-shaped array):

Materials per unit: 19 L (5-gallon) bucket and snap-on lid; matte gray plastic-adhesive spray paint; 56 cm (22”) of 0.64 cm (1/4") thick outdoor wood; eight 5 – 6.4 cm (2 – 2.5”) drywall screws; three 3.8 x 3.8 cm (1.5 x 1.5”) L-brackets (size 1/4-20); 13 machine screws (size 1/4-20) and hex nuts; four 0.64 cm (1/4") washers; three wing nuts (size 1/4-20); one 25 x 0.3 cm (10 x 1/8”) metal rod; one 30.5 x 30.5 x 0.64 cm (12 x 12 x 1/4”) acrylic sheet; one custom 28 cm (11”) focal-length professional PIR camera trap

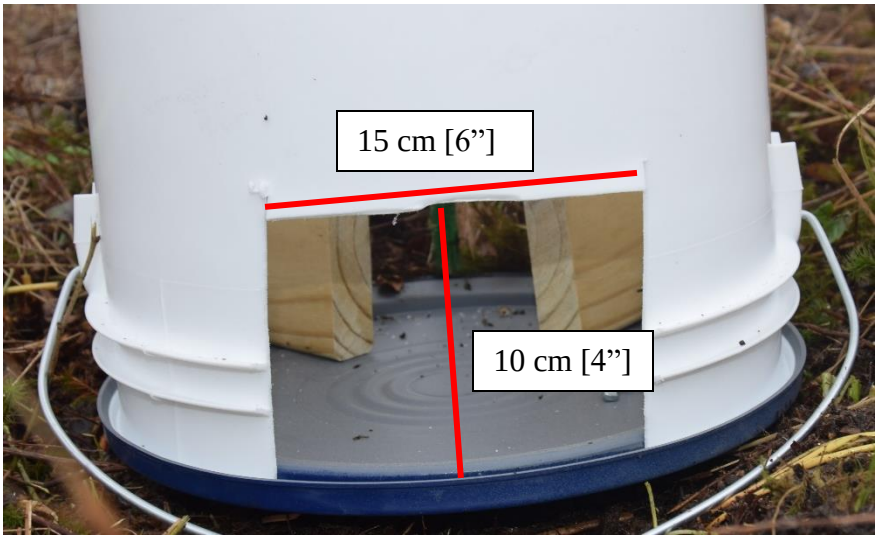
Tools: Drill (0.64 cm [1/4”] bit and a smaller bit for zip-tie holes); screw driver; hand shears; jig saw; sandpaper; multi-tool / pliers

1. Spray paint the inside of the bucket lid, and let dry outside.
2. Puncture a hole in the base of the bucket and use a jig saw to remove the base, leaving about 0.64 – 1.3 cm (1/4 – 1/2”) for strength around the rim. Smooth with sandpaper.
3. Invert the bucket and mark 15 x 10 cm (6 x 4”) openings at the front and back. Use a jig saw and shears to cut the openings. Smooth with sandpaper. Snap on the painted lid.
4. Cut wooden guide boards to length (two 20 cm [8”] externals, two 7.6 cm [3”] internals). If the bucket has ridges, notch the wood to allow for a tight fit along the openings.
5. Use a drill to make screw guide holes into the bucket, two holes for each piece of wood on either side of the front opening of the trap (eight holes total). The external wood guide boards are closest to the entrance opening, the internal guide boards are adjacent to where they end. Attach the guide boards to the bucket using a drill and drywall screws.
6. Make two small drill holes 30.5 cm [12”] above the front opening of the trap (these will be for the zip ties to attach the bucket to the drift fence; check for size).
7. Place the acrylic sheet on top of the inverted bucket so that there is minimal overhang over the front of the bucket (so that the drift fence can be flush with the trap but still not allow water in). With the front of the trap facing you, mark 0.64 cm [1/4”] equidistant holes around the top of the trap for the three L-brackets at 12:00, 4:00 and 8:00 with the L-brackets flush to the acrylic. Make the holes with a drill and attach the L-brackets to the bucket with screws and hex nuts.
8. Rest the acrylic on top of the L-brackets and mark the three outmost openings. Use a drill to gently make 0.64 cm [1/4”] holes, careful to not crack the acrylic.
9. Attach the camera trap to the underside of the acrylic so that the IR screen is closest to the entrance and the lens is directly over the internal guide boards. Attach by sliding the metal rod through the back of the camera casing. Drill holes in the acrylic for two screws on either side of the camera (each hole on either side and a tight fit to the metal bar). Use screws and washers to lock the metal bar in place, and lock in with hex nuts on the top of the acrylic plate. Double-check the camera orientation! You should be able to easily open the camera when it is attached to the acrylic to change SD cards and batteries.
10. Place the acrylic with the camera attached onto the L-brackets, and lock-in using screws and wing nuts. The acrylic should be easily removable in the field.

1. Grey plastic-adhesive spray paint on the inside of the lid.

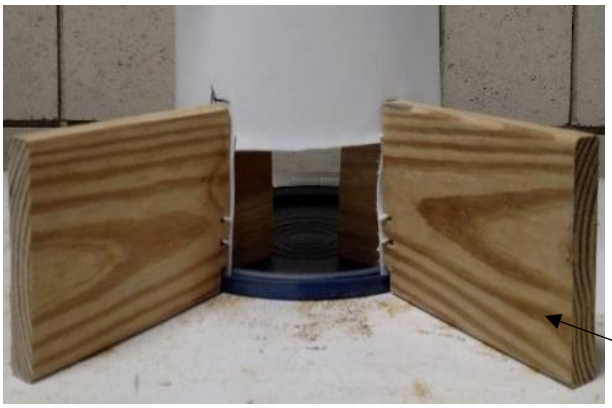
2. Remove the base of the inverted bucket (so that the lid would be on the ground). Leave some edge for strength.

0.64 – 1.3 cm
(1/4 – 1/2")

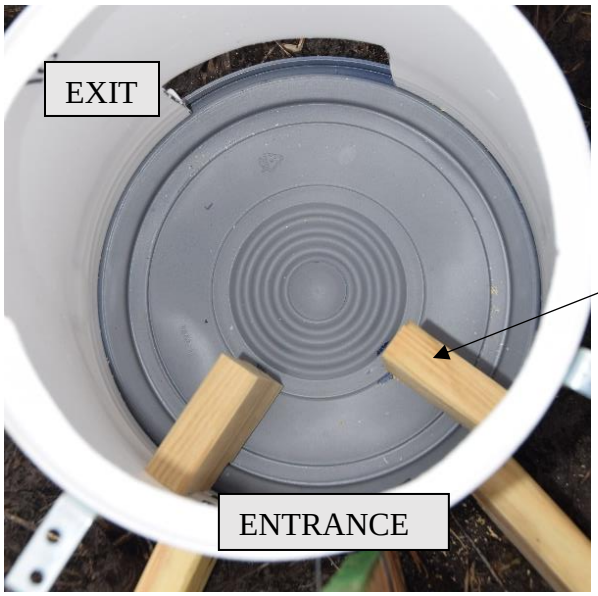


3. Cut entrance and exit openings (take the lid off first, and mark with a pen or sharpie). Keep the bucket handle so the unit is easy to carry them later.

4. Cut wood guide boards to length, and notch if necessary. Small gaps at the bottom can be filled with dirt later

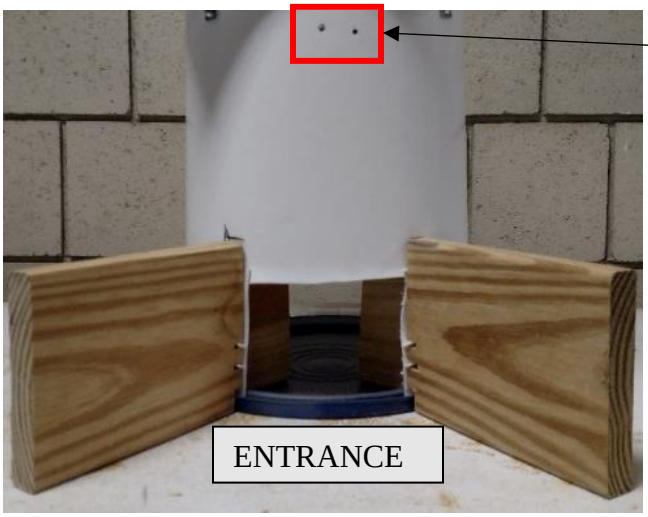


5. Attach external and internal guide boards to the entrance of the trap using drill and drywall screws (make guide holes first). Then snap lip on



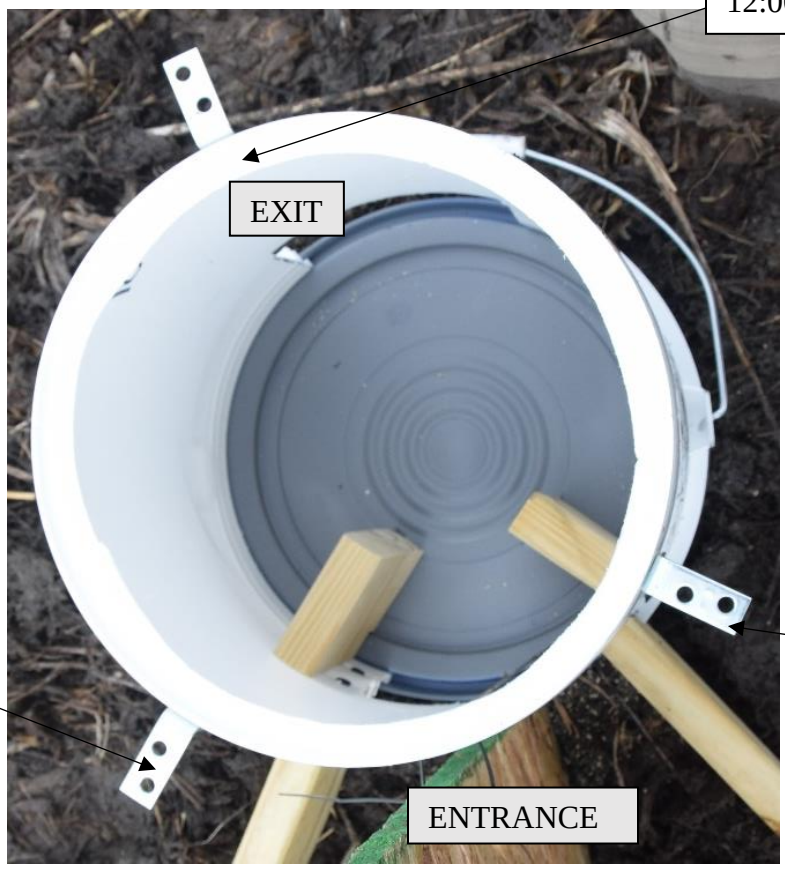
20 cm [8”] external

7.6 cm [3”] internal



Large enough for a zip-tie to fit in the holes, close enough together for the zip-tie to close when attached to the 1.3 cm [1/2”] thick fence with a small gap between the bucket and the fence (use long zip-ties if possible)

6. Make two small holes on the front, 30.5 [12”] above the ground

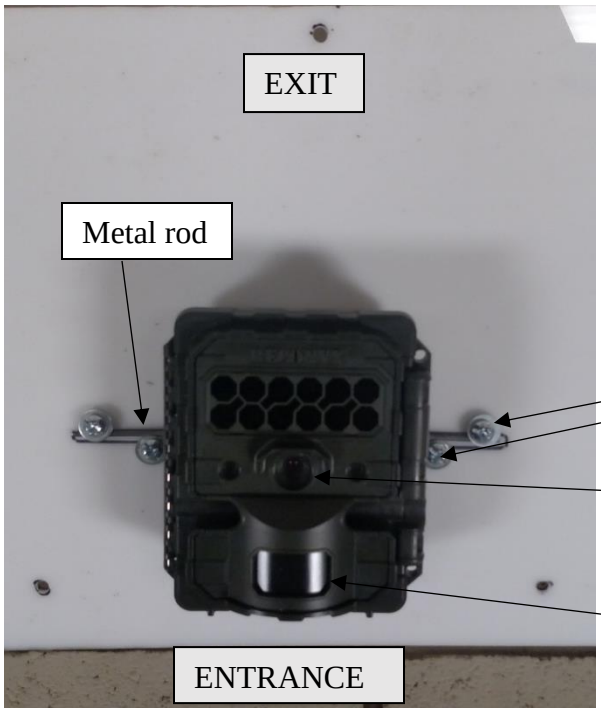


7. Attach L-brackets at 12:00, 4:00 and 8:00, ensuring the acrylic will rest on top of them flush with the bucket. Mark holes carefully before drilling. L-brackets should be equidistant around the bucket.

8. Mark and drill the holes on the acrylic, GENTLY. Ensure a good fit and that the screws hold. Hex nuts to attach screws to the bucket with pliers, and a wing nut for the acrylic with fingers. Then remove the acrylic and set the bucket aside.

Only one hole per L-bracket into the acrylic, use the outside hole

Housing unit is now complete, next is to attach the camera trap to the acrylic.



9. Slide metal rod through back of the camera. Drill holes in the acrylic, GENTLY, around the metal rod. Use screws and washers to lock into place, with hex nuts on the top of the acrylic. ENSURE CORRECT ORIENTATION! IR sensor should face the entrance, and camera lens should be directly over the internal guide boards.

Screws with washers

Camera lens

IR sensor

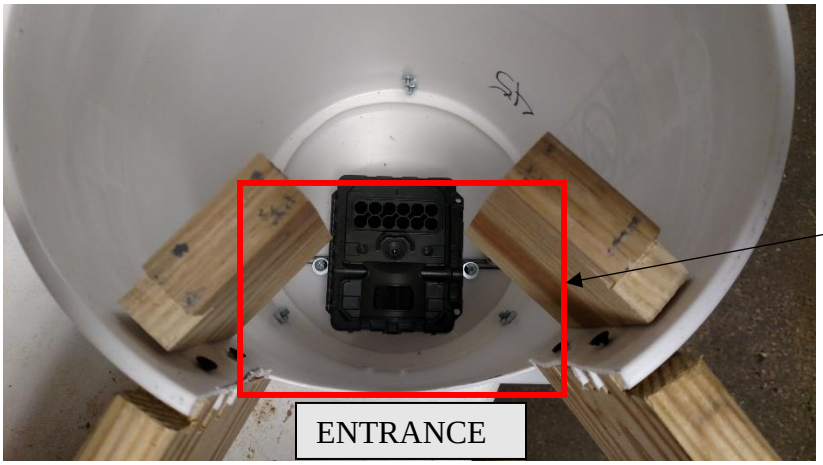
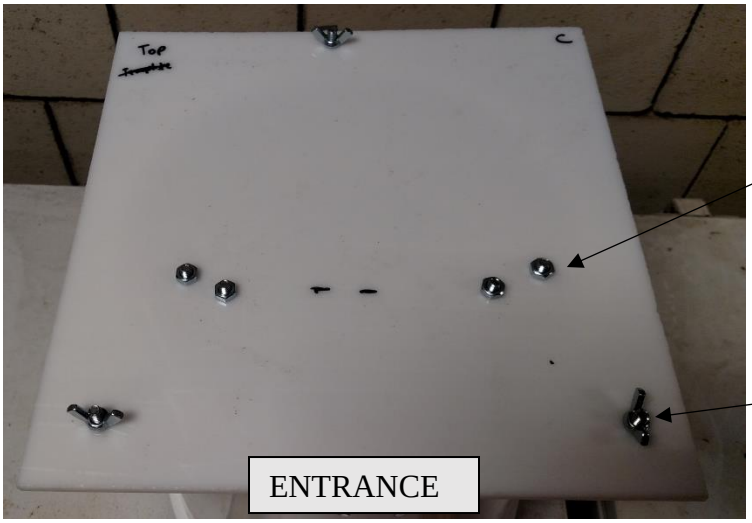
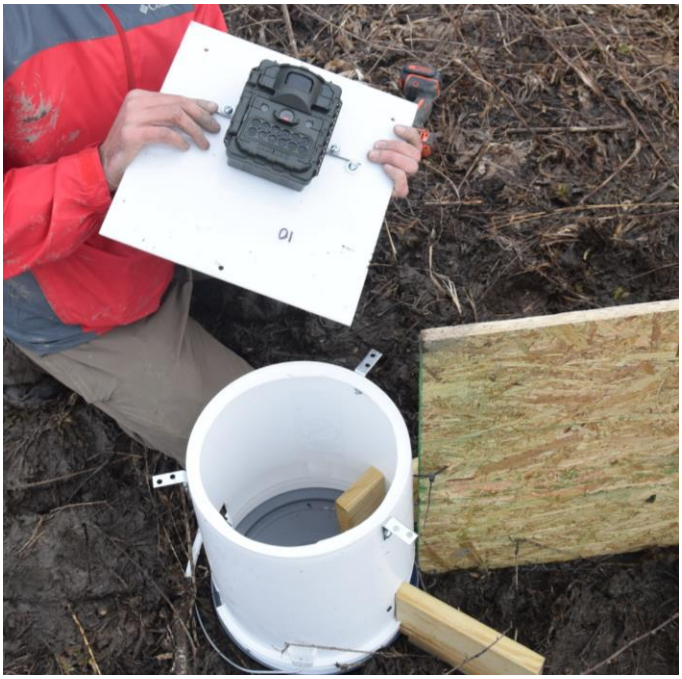


Image window – directly under the lens, over the internal guide boards

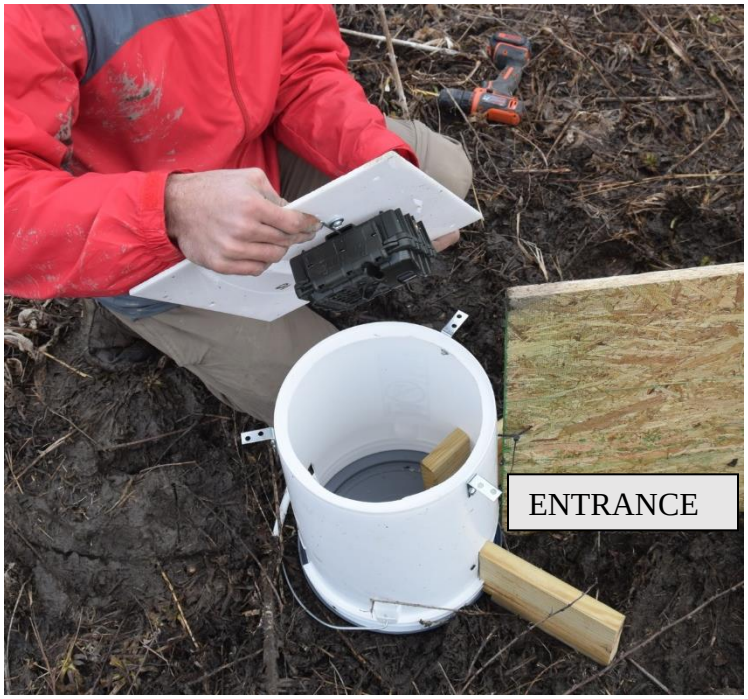


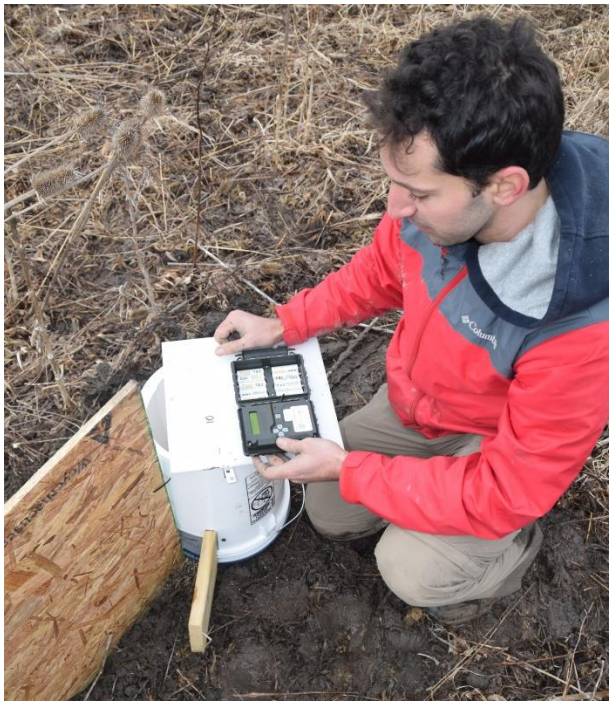
Hex nuts attaching the metal rod to the acrylic

10. Wing nuts attaching the acrylic to the bucket – UNIT COMPLETE



Acrylic is easily removable in the field by unscrewing the wing nuts. Camera should be able to open to allow changing batteries and SD cards without removing from the acrylic.





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Array Deployment (Y-Shaped)

Materials per array: three constructed camera trap housing units; six 244 x 61 x 1.3 cm [8’ x 2’ x 1/2"] oriented strand board (OSB); 13 metal fence posts (91.4 cm [3’] height); six 5 cm [2”] metal screws (size 1/4-20) and wing nuts; six heavy-duty and 15 regular UV-resistant zip ties

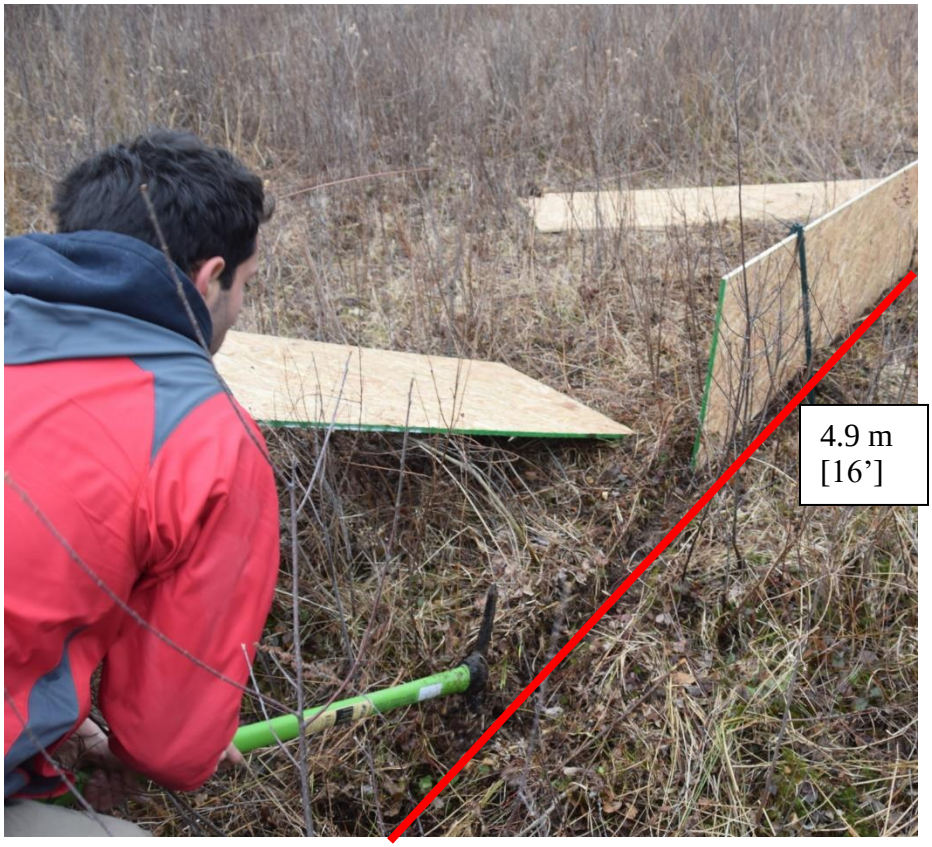
Tools: Mattock or powered trencher (at least one); metal mallet; cordless drill (0.64 cm [1/4”] spade and regular bits); multi-tool / pliers; screw driver

1. Select array location with relatively even ground, so that the arms won’t go through impassable rocks or large shrubs. Mallet in a fence post for the center of the array.
2. Slide heavy-duty zip ties into the central post openings, one at the top and one at the bottom for each arm of the array (be careful with zip-ties orientation, taking into account the direction of each arm).
3. Use the mattock to dig a shallow 4.9 m [16’] trench for the first drift fence to rest in. You can maximize efficiency by having multiple mattocks so that team members can dig trenches simultaneously, or by using a powered trencher.
4. Place one OSB board into the trench so that the board is flush with the central metal post. Use the spade bit to drill two holes at the top and bottom of the board next to the post, and attach to the post with heavy-duty zip-ties.
5. Place a second board into the trench so that the boards overlap slightly. Use a 0.64 cm [1/4"] bit to drill through the boards, and attach together with a screw and wing nut.
6. Mallet in two fence posts to stabilize each board by crossing posts over the board. Use regular zip-ties to hold the top of the posts together. Four fence posts total for each arm of the array.
7. Repeat steps 2 – 6 for the next two arms to complete a Y-shaped array.
8. At the end of each arm, clear a flat space for each camera trap housing unit. Drill a hole into the OSB even in height to the small holes on the front of the bucket, and attach together using regular zip-ties.
9. Back-fill all along the OSB drift fence and the bucket wooden guide boards with dirt, to ensure that there are absolutely no small gaps for animals to move under the boards. Small snakes can move through pinky-sized holes.
10. Remove the acrylic from each bucket, open and set the cameras. Replace and lock-in the acrylic to the buckets, and the array is operational.

1. Mallet in the central post. Red arrow shows the direction of the first arm to be constructed.

2. Slide in the heavy-duty zip-ties into the post openings. Red arrows show the direction that they will close in.

3. Dig a shallow 4.9 m [16’] trench for the drift fence boards



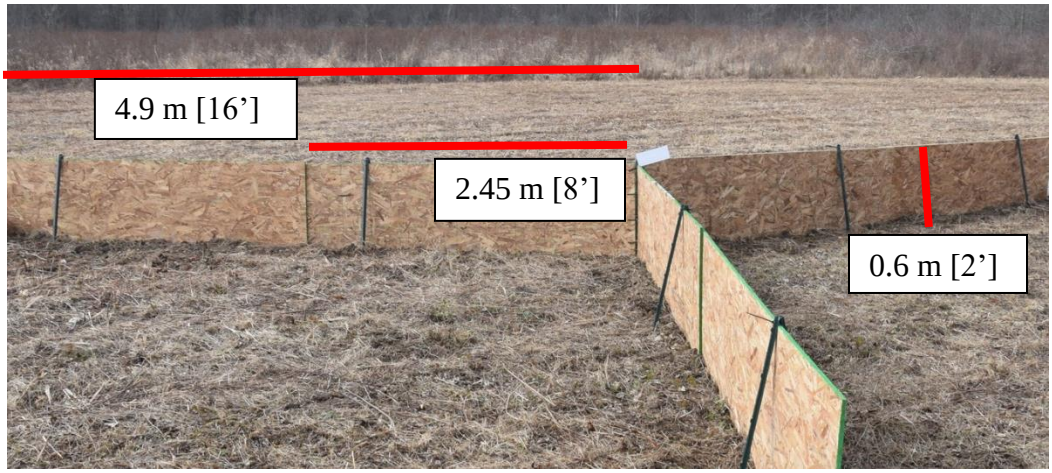
4. Attach the first board to the central post. Make sure to drill holes aligned with the two correct zip-ties (once the board is attached, moving zip-ties around is difficult)

5. Attach the second board to the first using a drill, screws and wing nuts.

Overlap the boards slightly

6. Mallet in two fence posts for each board, crossing at the top. Secure the posts together at the top with a zip-tie.

Zip-tie



7. Repeat to finish all three arms

Central post

8. Zip-tie the buckets to the drift fence arms. As flush as possible while still allowing the acrylic to be attached on top of the buckets.

9. Back-fill all along the array, buckets and guide boards. May need additional back-filling as the water table and soil sets in the first few weeks. Small snakes can move through pinky-sized holes.