Index Tracking With Lasers

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By Freddy Osuna

The Wolf

``Now is the Law of the Jungle---as old and true as the sky;

And the wolf that shall keep it may prosper, but the wolf that shall break it must die.

As the creeper that girdles the tree-trunk, the Law runneth forward and back---

For the strength of the pack is the wolf, and the strength of the wolf is the pack.''

Rudyard Kipling

Unlike the wolf who possess a sense of smell 100 times greater than ours and can detect trace scents up to 3 days old, humans are primarily visual creatures. The wolf's ability to track prey day or night is envied by 21st century humans who delve in the craft of visual tracking. No matter how many scent stands, observation lanes, walk abouts and vision quests you take part in, you are going to experience a sensory wall that falls far short of that experienced by the wolf.

I have experienced the sense of dread that a tracker feels with when the sun begins to set while hunting bad guys in the Middle East, on search and rescue missions in Arizona, and training military around the globe. I refuse to be limited by my environment, but I have also hit my sensory wall. So what's the solution? For now and the immediate future, there are small but effective measures trackers can take to maintain their abilities to acquire and follow a trail in low light conditions. The solution lies in combining the age old skill of visual tracking with 21st century technology.

First, we will explore the most widely used techniques with consideration to tracking at night using artificial light sources. There are 3 main considerations for executing night tracking:

1. Does the situation and terrain lend to your ability to safely and effectively follow a trail at night? (risk vs. gain)
2. What type of artificial light sources do you have available?
3. Do you possess the experience and training necessary to complete this advanced task?

The first consideration addresses the situations and terrain suitable for tracking at night. Tracking at night is an advanced skill; it is ten times harder than day tracking. If your situation, taking into account weather and safety issues, allows you to consider this option, than you must now consider the terrain. Does it present an unfavorable advantage to your quarry, or a safety risk to your team? Is it of a particular medium that would make it difficult to track on during daylight? Would tracking on this terrain be complicated even in the most favorable conditions, i.e. pine needles, short grass, or whatever your weakness may be?

The second consideration covers artificial light sources. Your trade determines your light source needs: if you are a Search and Rescue Tracker, you may be accustomed to carrying a high powered white light and running it constantly; a military member will most likely have access to hand held and weapon-mounted infrared (IR), white light, and colored beams which all serve various purposes. I will explain the best use of each type of light that may be available to you. The constants which apply to all of these are as follows:

1. When attempting to view or enhance detail in a track, it is best to illuminate the track with the device at a low angle as to create an artificial time shadow effect. As the sun moves across the sky, shadows are cast which change in length and direction. In a track impression, these shadows are in the form of recognizable patterns and shapes. A tracker's shape/pattern recognition and change detection abilities are what allow him to follow a trail.

White LED

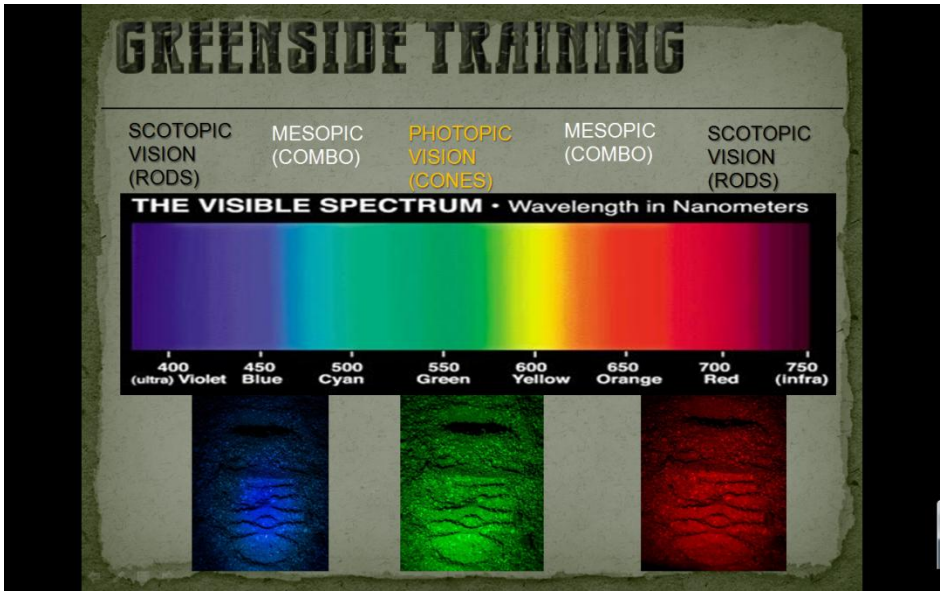
You are trying to enhance the detail in the track to determine if it's the track you want to follow. Mounting the light low on a trekking pole or at the fore end of a weapon can help achieve this low angle, but I prefer to keep a light in hand because it seems that the distance, height, and angle required to view a track using light changes with each track.

2. The type of light used to get information is a huge factor. Incandescent bulbs are great in terms of cost and availability but have a huge draw back in terms of tracking. The light projected from incandescent bulbs creates what is called a halo effect. These are the visible rings ranging in brightness and size. These lines/rings dilute the detail in the track by projecting edges or shapes where there are none. This confuses the brain and fatigues the eyes. If an incandescent light is the only light available, training and practice may help overcome these factors.

   LED lights are excellent for enhancing details in tracks because they do not have the halo effect. Their cost and availability are comparable to incandescent flashlights. IR filters with Night Optical Devices (NOD's) can also be used to see tracks, but is very difficult. Most of these devices must be focused at a depth that allows the user to properly navigate the environment. You will constantly be switching between a focus that is good for navigating and a focus to achieve track resolution. Add this invasive task to the dynamics of a battlefield or other high stress environment and you will find it becomes less than practical.

3. The color of light you are using will have a big effect on your eye and brain perceptual abilities. In order to establish a footprint as being from the intended subject, a tracker has a standard for what he considers to be definitive spoor. He must be able to determine that the track he is looking at is consistent in size, type, pattern and age to that of the subject.

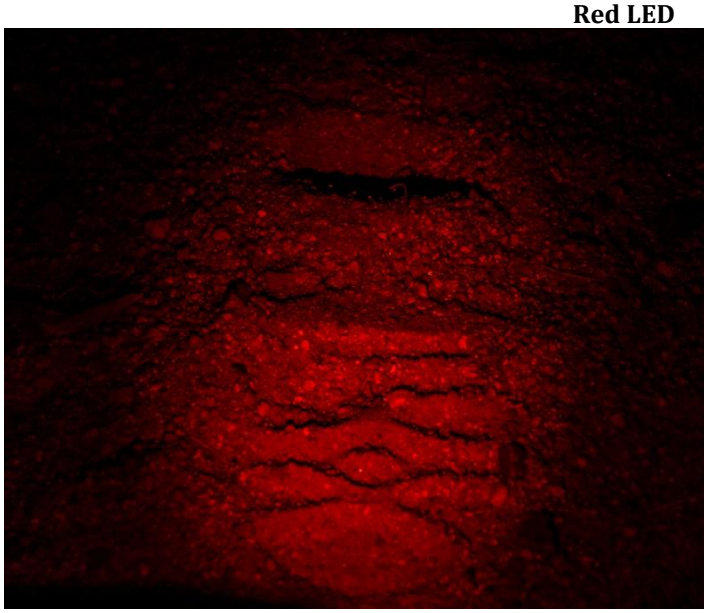
   White light is what most people first consider using when looking for tracks at night, and can be very effective if employed in the proper manner. White is the only color that allows us to properly assess the color of the soil, which is a key factor in determining age of a track. White light is the result of combining all colors of the color spectrum (blue, green, yellow, orange, red).



Which has more depth & detail?

Red light is widely used in the military because it helps to preserve our night vision by reducing the average time it takes for our eyes to adjust from photopic (daylight) to scotopic (night) vision. Red light diffuses rapidly with distance making it difficult to detect by enemy combatants depending on range and exposure. For the same purposes red lights are great for threat reduction and night vision adaptation, red makes viewing details in a track difficult. Red lies at the far right edge of the color spectrum before Infra Red.

Red LED



Blue light in tracking has limited use but can very effectively help to follow blood trails, and enhance the detail of tracks in snow. Ultra violet is commonly paired with Luminol by crime scene investigators to find blood traces. Blue lies on the far left of the color spectrum before Ultra Violet.

Blue LED

Luminol/blood under Ultra Violet Light

Green lies in the center of the color spectrum and seems to produce the most accurate details in a track. By carrying a high powered Green LED to confirm sign and a white light to follow the trail, trackers have adapted to the night over the last ten years.

Green LED

Training

So far I have explained the gist of what has been taught over the last 10 years by your most renown Combat /Tactical Tracking Schools in the United states. There has been little deviation from these basic concepts because they are constants that will always apply to human vision and light sources. As technology advances so will our abilities as trackers. The variation in night tracking training between schools lies not in the constants I just explained, but in tactical tracking tactics / operating procedures. The most important thing is that you get trained formally by a credible outfit before attempting this craft in a dangerous scenario.

Incorporating lasers

As a Scout Sniper Team Leader I found that the use of Night vision and IR was not practical, and the use of artificial light sources is limited to certain tasks like map reading and signaling for example, especially for a sniper team during movement. The only way we tracked at night was with the help of ambient light provided by the moon and stars and this had some obvious limitations. I have always been the first to point out the dangers and difficulties of tracking during hours of darkness, and to this day I highly advise that you reconsider tracking an armed and trained individual at night unless you have extensive training and experience, overwhelming firepower, superior numbers, helicopter support w/ FLIR, and dogs.

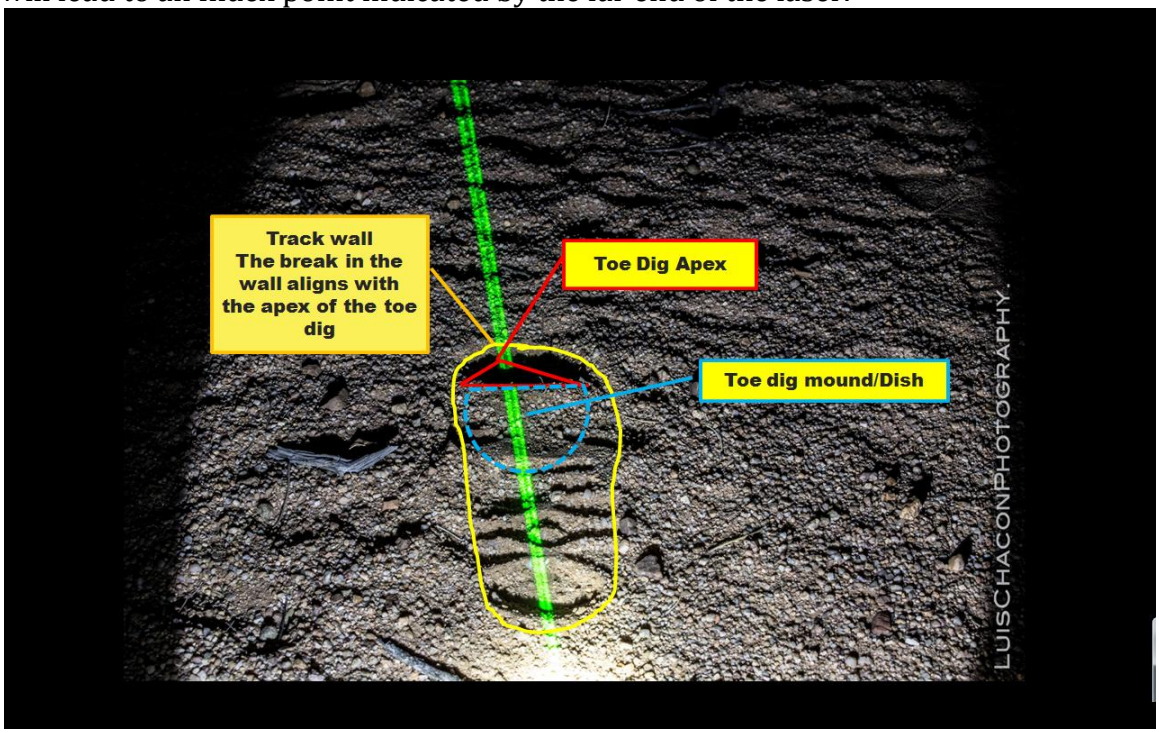
With this in mind I will offer a new technique to be incorporated into your night tracking tool box. I discovered this technique not by trying to create a better way of tracking at

night but as a training method of increasing a trackers ability to accurately interpret sign and determine precise directions of travel during the day. This concept originated as an Index Tracking method but can be easily adapted to any operationally sound system of tracking. Index Tracking is based on a foundation of 3 pillars.
1. A tracker must develop a criteria /standard for evaluating spoor
2. A tracker must be able to determine precise directions of travel and index gaits
3. A tracker must have an acute environmental awareness and ability to maintain a low signature

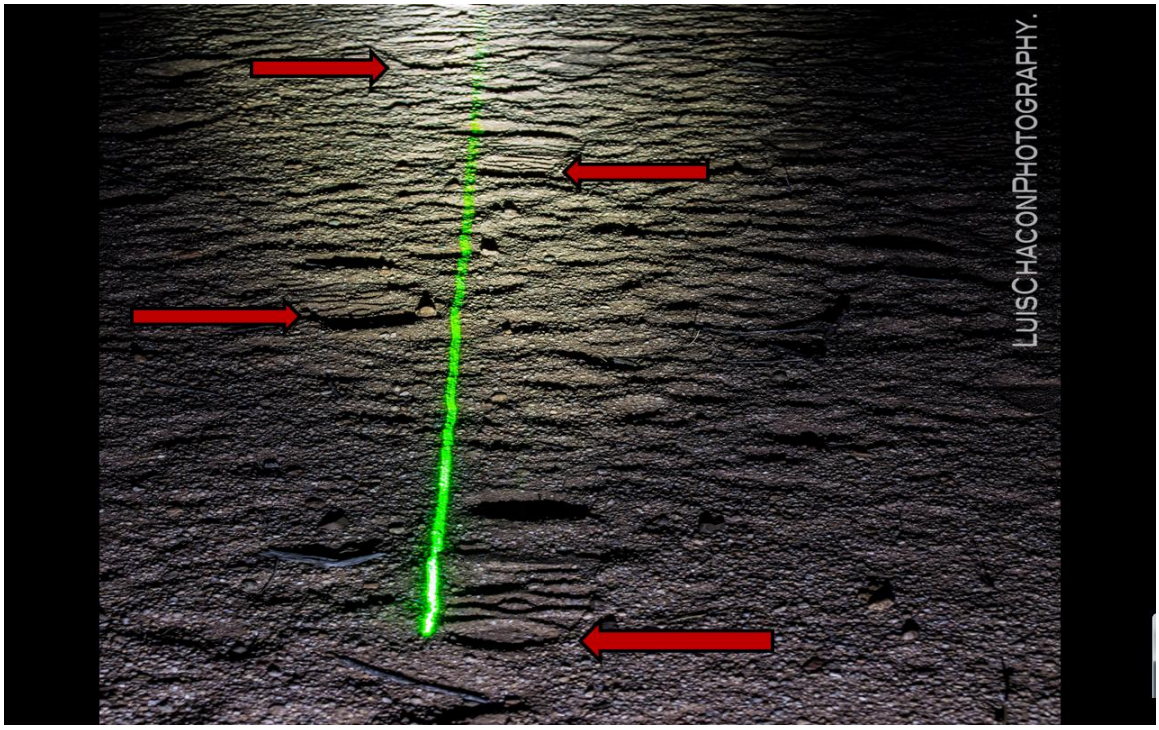
To train my students I use various drills that are designed to test their ability to execute various learning objectives. The drill that this technique derived from is called the Night Casting Drill. It is performed by evaluating a track in darkness with artificial light sources using the criteria for definitive spoor (size, type, pattern, and age). If the track meets the criteria, than the tracker has acquired a definitive track thereby demonstrating the ability to perform pillar 1 of Index Tracking. Next, the tracker must perform pillar 2 determining precise directions of travel and acquiring Index gates in darkness with the use of lights. In order to determine a direction of travel using one or multiple foot prints he must evaluate the toe dig apex, track wall, horizon line, track floor, dish, caves and cliffs in a single track as well as the line of progression, foot orientation, and terrain. Once the tracker identifies that he has an Index point or a point where the subject is highly likely to have moved to as identified by the track. He must now confirm this by moving to that point to find another indicator which should lead to a track. The tracker is tracking from index point to index point and the distance between these points will vary depending on the trackers accuracy, and terrain. The objectives of this drill are to test the accuracy of the trackers ability to evaluate spoor, to read directional indicators, and to shoot accurate index points. By performing this exercise at night I can best evaluate their ability to perform the objectives because they are essentially blind between index points. This greatly increases a student's confidence in trusting what they read and has the effect of increasing speed and accuracy during daylight tracking performance. Subsequently I found that this process made for very smooth and efficient night tracking as well. The process I described is a constant, and no matter who you learn how to track from you must be able to confirm, interpret and follow a trail in a similar procedural manner to be successful. Since this process is a constant, than it is no big surprise why it works day or night, the only thing that changes are the tracking team procedures which are dictated by your unit Standard Operating Procedures (SOP). An example of these SOP's are; which formations to use, task organization, and contingency drills. Remember this golden rule before you try and get to sexy. The more efficiently a tracker handles the trail, the smoother and safer the tactical movement will be, and this is especially true at night.

Indexing with a laser. So first try and use Index Tracking during the day so that you can have a frame of reference for how to incorporate the laser and lights into night tracking. Index tracking is excellent for combat / tactical tracking applications because it minimizes the amount of time the tracker spends staring at the ground. He is tracking from index point to index point, so in between these points his head is erect, seeing hearing and smelling for the subject instead of constantly looking at the ground. In regards to tracking this process is designed for you to achieve a balance between speed and security.

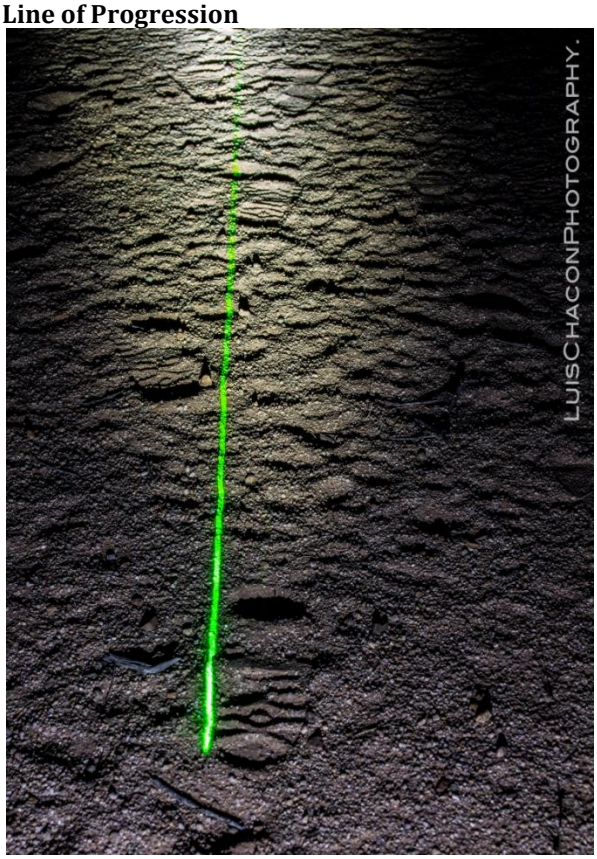
Incorporating lasers will enhance this process. So how do we use the laser? Once the tracker I.D.'s his track using a visible light source (pillar 1) he must now shoot a primary index point. The tracker uses a parallel laser by aligning the beam with various directional indicators throughout the track which will match the subject's line of progression, which will lead to an Index point indicated by the far end of the laser.



Laser w/directional indicators



Line of Progression

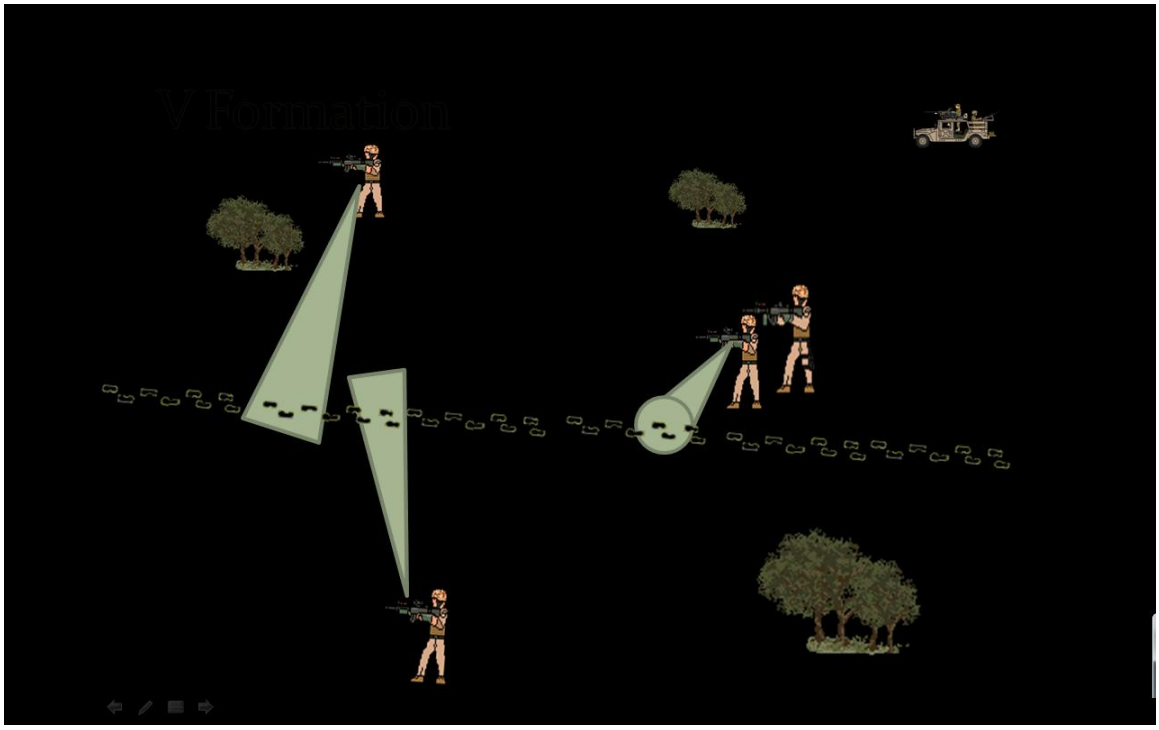


This process is best with but does not require a secondary tracker. A secondary tracker will speed things up for your team though. When the Laser is indexed the second tracker moves up to the point and searches the ground for confirmation. After he acquires the track, he can shoot the next index point with his laser, or the primary tracker moves up to verify and redeploy the secondary tracker once again which is what I suggest doing for many reasons.

Tracker indexing w/laser

2nd tracker moves up to index point

Traditionally an inverted wedge/V or X formation is used and 2 trackers move up ahead to help acquire the tracks by flashing their beams to the inside of the trail as if to contain it for the primary tracker. This can be done with Infra red beams and night vision devices as well. This headlight method works well with teams that have excellent communication, just make sure your headlights do not start competing for the track line. If needed the rest of the team satellites around this headquarters element for protection.

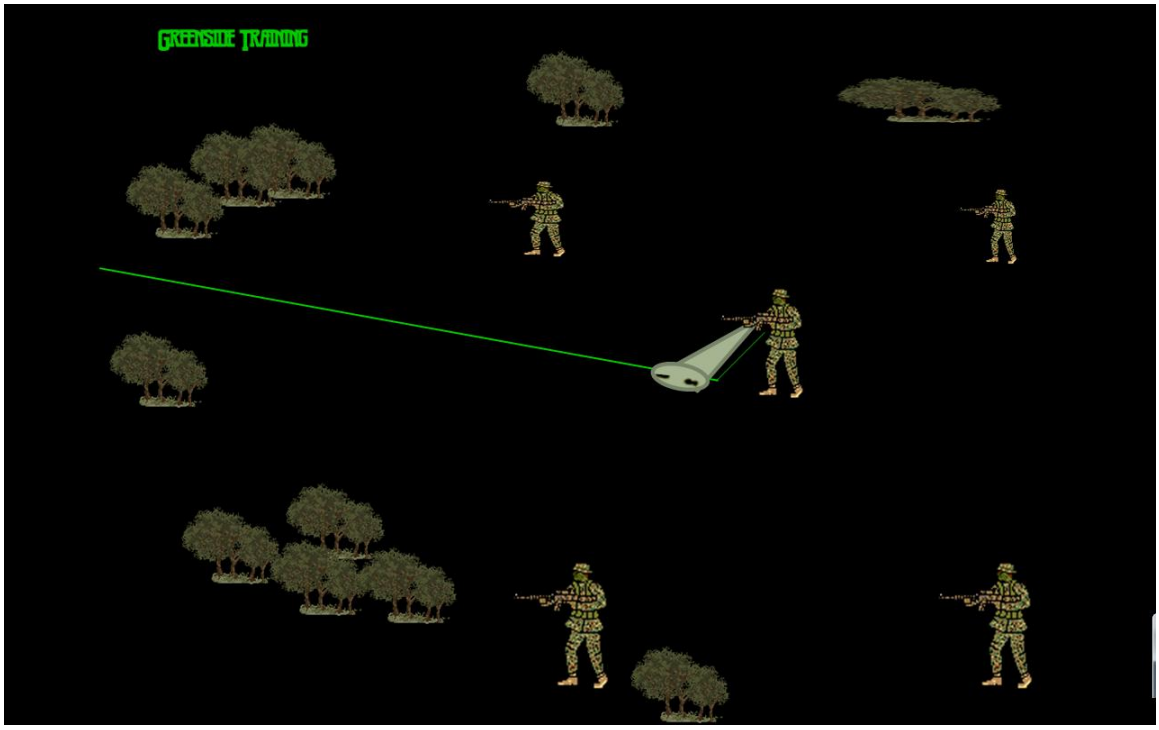


Headlights/Inverted wedge/Inverted V

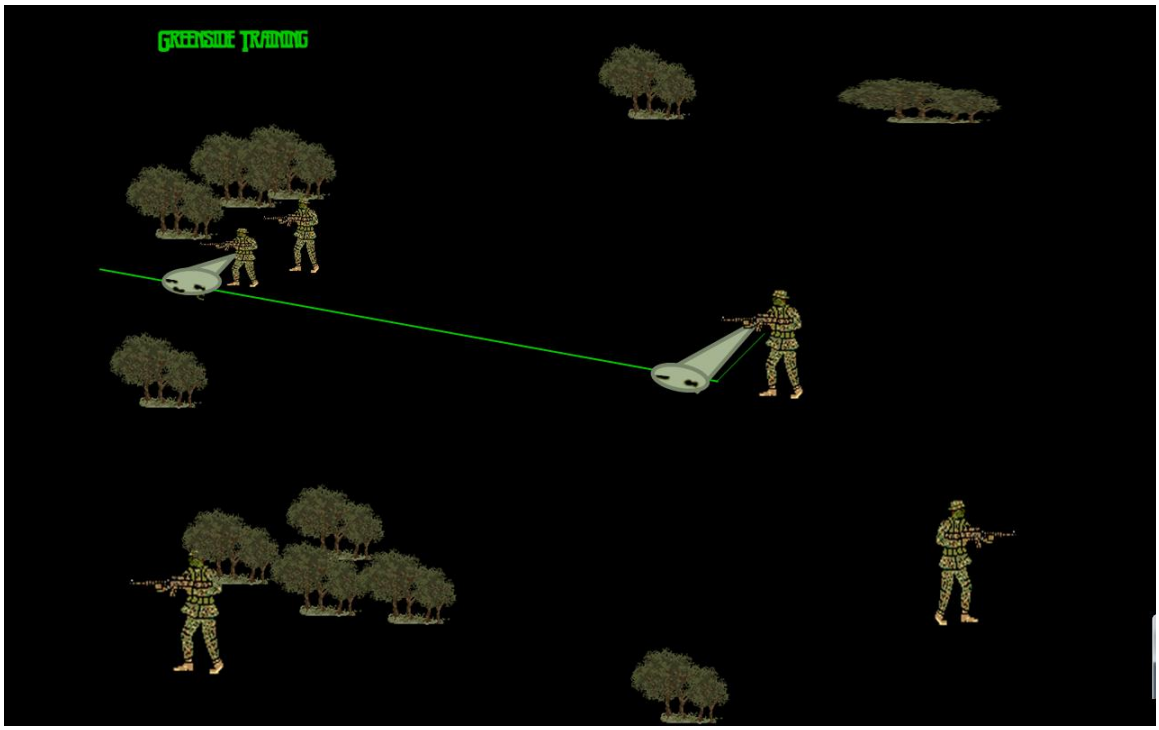
By using the Index Tracking w/ laser method you will have more flexibility and control of your formations at night as well as many other benefits in both passive and hostile environments.

<u>These are some of the benefits of Index tracking with lasers.</u>

1. Statistically reduces search area
2. Increases instant shape and pattern recognition at greater distances
3. Reduces verbal communication
4. Increases tactical dispersion of team mates
5. Reduces visual target signature of tracking team
6. Promotes formation discipline and command and control
7. Increases efficiency in the Trackers decision making process OODA Loop
8. Balances speed and security during night tacking movement
9. Reduces eye fatigue
10. Increases tactical awareness by Indexing team orientation (senses / firepower / NVG's)
11. Reduces the deployment of white light by up to 50%



Tracker indexes with laser

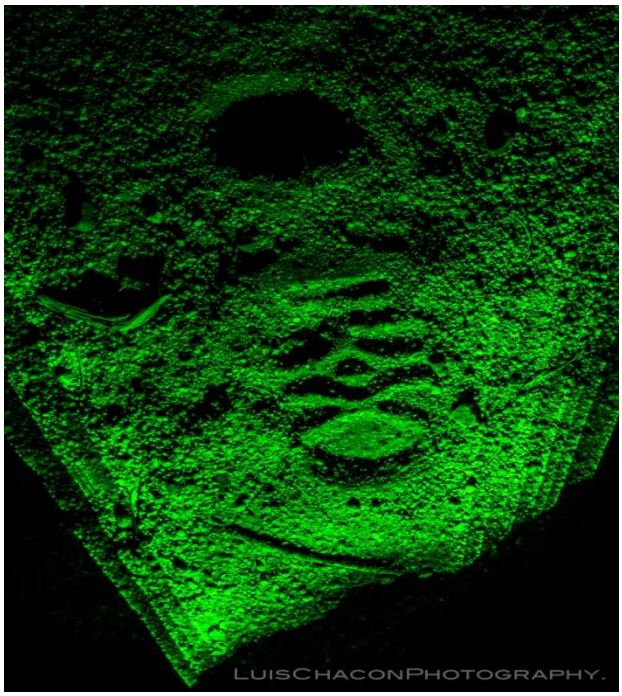


Confirming at index gate

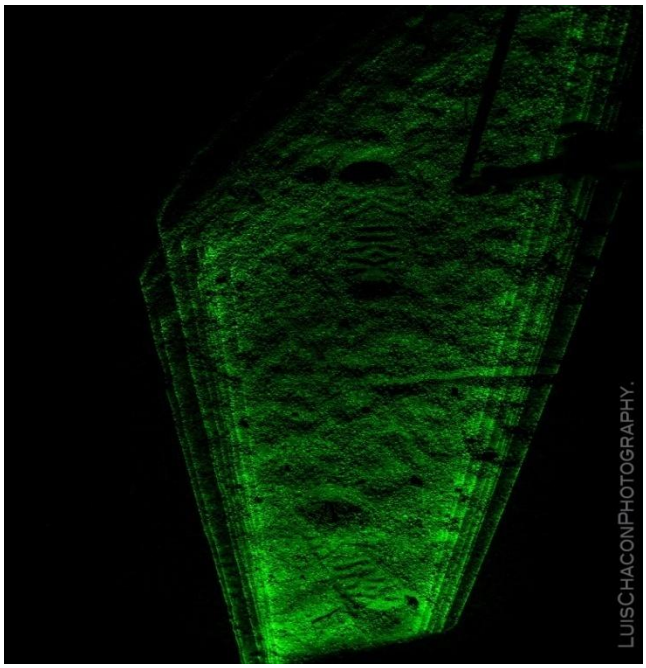
Although I have been theorizing about how I could incorporate lasers into night tracking for the last 5 years. I have been limited as to what equipment was available in the commercial market. Up until this point I have been using red line level lasers used for construction and home improvement purposes. I recently found a company called Beam of Light Technologies Inc. out of Clackamas Oregon (Z-BOLT) who provide green line lasers to the tactical industry. I contacted John Mueller the owner of Z-BOLT and requested a Test & Evaluation kit. They sent me a C-TRIP-10G Green Dot & Line Laser. It came with a retention lanyard, quick detach weapon mount, pressure switch, and coyote tan pouch.

After extensive testing I have found that the green laser has not only proven to exponentially improve on the results of the red laser but the green laser actually presents new capabilities as pertains to tracking at night. The largest and most profound of these capabilities is the ability to use the laser in the track identification process as well as the indexing process which statistically reduces the tracking team signature. By flickering or sweeping the laser over the trail rapidly left and right, the tracker can resolve size, type,

and pattern within multiple corresponding tracks without a high signature white beam.



Sweeping the laser produces image



Sweeping left and right rapidly

Focus of the beam into a concentrated surface area also reduces a tracking team's signature. The type of surfaces that I have been able to use the laser on with success are comprised of dirt with sparse vegetation. If the laser is applied in leaf litter, pine needles or any other terrain with heavy vegetation, than confirmation is going to have to be done by white light, while indexing can still be achieved with the laser. Another great observation I found during training was that the laser increased a trackers ability to sort through heavy contamination. This is because the laser significantly reduces the search area to the most probable paths of travel or gates. The incorporation of lasers have improved every aspect of night tracking for me. I will continue to incorporate the laser in training and on Search and Rescue missions. My next evaluation will be on the Infra Red Z-BOLT C-Trip, with night vision. If you are a trained tracker and have long wandered how to improve your night tracking capability than I highly recommend trying our technique. If the cost of the C-Trip is to expensive than first try a cheap red line laser level that you can get for under 20 bucks at your local hardware store. When you decide to get serious contact John at Z-BOLT and tell him I sent you. Until next time, TRACK ON!