

White-tailed Deer Survey For Shelter Island, NY



Conducted by:

Susan Bernatas, Certified Wildlife Biologist
Vision Air Research, Inc.
904 East Washington Street
Boise, Idaho 83712
www.visionairresearch.com

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Vision Air Research, Inc. was retained to conduct a white-tailed deer survey for Shelter Island, NY. This survey was conducted using airborne infrared, commonly called forward looking infrared (FLIR).

The survey was conducted December 18, 2005. Flight times were between 1800 and 2400 hrs. The surveys were conducted under good conditions for aerial surveys and infrared surveys. Skies were clear.

The survey was conducted using transects which ran northwest – southeast and were spaced 700 ft apart. Flight altitude was 1,000 ft above ground level of the highest point on the property. The sensor look angle was held at roughly 45 ° elevation or down look angle. A slight side-to-side sweep was used. This sweep increased detection by increasing look angles.

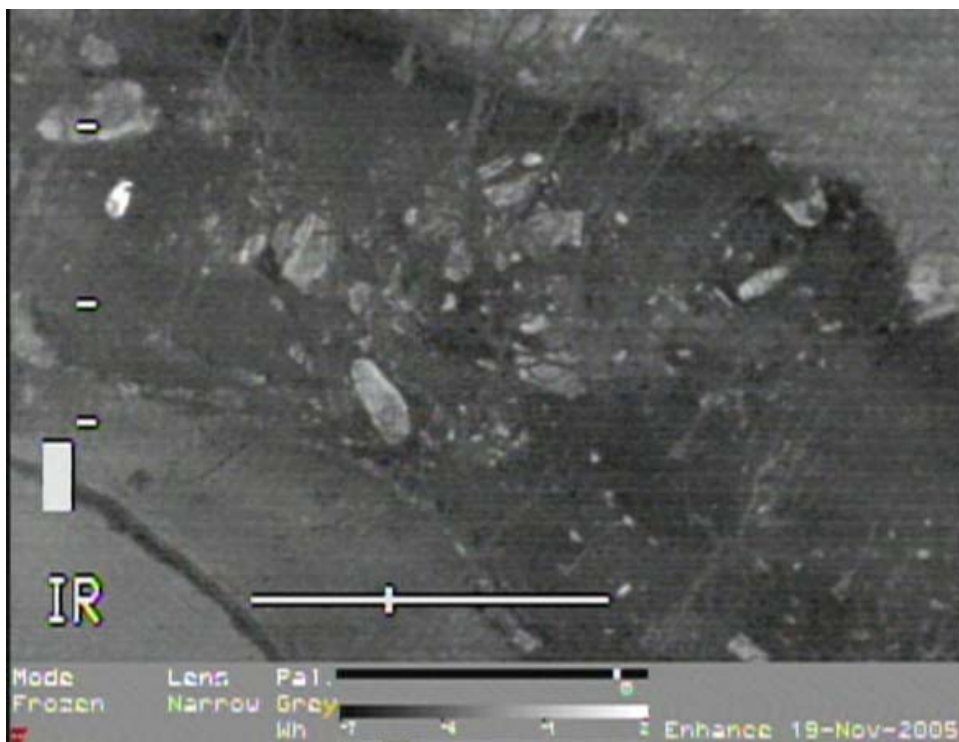
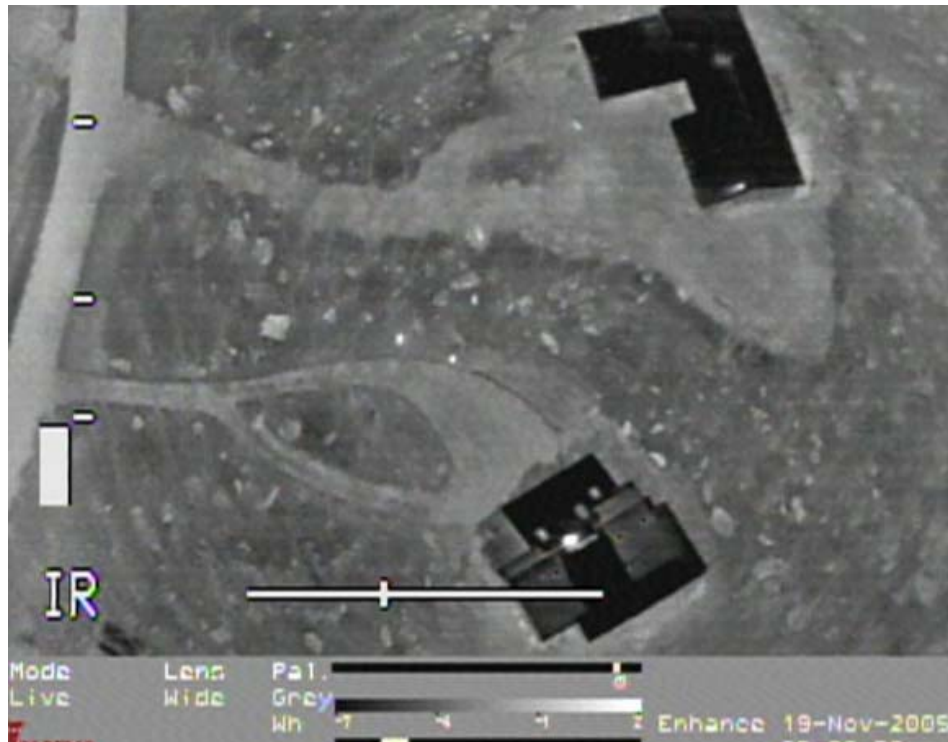
The portion of the flight within the study area was recorded on videotape. The pilot and sensor operator communicated to verify the location of the boundaries to turn the tape off and on. The sensor operator turned the tape off at the transect end and commenced recording at the start of the transect. Animals were located by observing their level of emitted infrared energy versus background levels. We have the ability to switch fields of view to zoom in and confirm our subject (Figure 1).

The tapes were reviewed by playing the tape backward and forward and in slow motion to identify deer and map their location. Duplicates or repeat deer were identified and eliminated as needed. Individual deer were mapped to general location based on the GPS position of the airplane, elevation and aspect of the look angle of the sensor, and feature such as roads. The USGS map for the area does not have all building locations so positions are relative to those available on the map and terrain features. Since deer move this approximate location should not confound development of deer management objectives.

We used a PolyTech Kelvin 350 II (Sweden) mounted on the left wing of a light fixed-wing Cessna 206. The gimbal allows 330 ° of azimuth and 90 ° of elevation allowing us to look in all directions except directly behind the airplane. The infrared sensor installed in the gimbal is the high resolution Agema Thermovision 1000, which is a long wave system (8-12 micron). It has 800 by 400 pixels providing good resolution and the ability to determine animals by their morphology or body shape. The thermal delta is less than 1 ° C, which means it can detect objects with less than 1 ° C different than their background. It has a wide (20 °) and a narrow (5 °) field of view (FOV). At 1,000 ft. above ground level looking straight down using the wide FOV the footprint or area covered by the sensor is 360 ft. x 234 ft. while the narrow FOV provides a footprint 90 ft. x 59 ft. The look angle for this survey averaged 55 ° providing a footprint width of 440 ft. in wide FOV and 110 ft. in narrow FOV.

The sensor operator / wildlife biologist sat in the rear seat and watched a high resolution 9 in. monitor to aim and focus sensor. We recorded the infrared on mini-digital videotape (Mini DV). Thermography data and look angles (i.e., azimuth and elevation) data were overlaid on

Figure 1. These images show an example of the two fields of view we have available: wide (top) and narrow (bottom). One deer bedded in the center of the top image is shown in the bottom image. The deer is much brighter (whiter) than the surrounding rocks.



the screen as was GPS information (i.e., Greenwich Mean Time (GMT), latitude, longitude).

Results

A total of 189 groups (Figure 2) totaling 570 deer. I mapped and counted all deer located during the survey. Deer were observed walking and feeding, but the vast majority was bedded.

The visibility or ability to detect a deer through the vegetation ranged from 80 – 100 %. The areas with deciduous cover had a detection rate of roughly 80 % based on the potential for the overstory vegetation to obscure the deer from the IR detector. Open meadows had 100 % detection. If the sensor passed over the area the deer would be detected. I used a side to side sweep to scan along the transects allowed transects to overlap slightly to provide good coverage. Deer groups observed in more than one transect were only counted and mapped once.

An ESRI shapefile of deer group locations and group size and example images are provided in separate zipfiles.

The videotapes of the survey will be kept on file with Vision Air Research for one year.

Figure 2. Deer mapped within on Shelter Island, NY during the aerial infrared, commonly called forward-looking infrared (FLIR), survey conducted between 1800 – 2400 hours on December 18, 2005. Deer groups are noted with a yellow target.

