

Title: 'Critter Cam – Reducing the Risk of Working at Heights'

Consolidated Rutile Limited

Introduction:

Consolidated Rutile Limited (CRL), Is a mineral sands mining operations based primarily on North Stradbroke Island. CRL has been in operations for over 40 years and has a long history of innovative rehabilitation of the land post mining. With almost 4000 hectares of rehabilitation, CRL are a world leader in progressive rehabilitation.

As part of its research program CRL has had a long running study into the use of artificial hollows or nesting boxes for encouraging wildlife to return to the rehabilitated areas. Over the 12 years that the program has been in operation, many hundreds of nesting boxes have been installed on young trees, in the rehabilitations. These are installed by hand, often on slopes of over 20 degrees at heights ranging from 2.5 to 5 metres. Inspections of the boxes has also been done by ladder and climbing gear until now.

Problem/Initiative

The process used for inspecting nesting boxes, within the rehabilitation area of the Bayside Mine, previously involved persons using a ladder against the nesting box tree, opening the nesting box and viewing the animals inside for identification. With this system, there were numerous occupational safety hazards:

- **Soft Tissue Injuries** - The rehabilitated slopes of dunes are typically 20-25 degrees. 'Lugging' a ladder between each 'line' of nesting boxes was physically demanding. The ladder, with all other equipment, (clipboard, pen, harness equipment, cordless drill) was of considerable weight and required two, physically fit persons to operate. Despite reasonable fitness levels, employees became easily fatigued. Each 'line' is between 100 and 300m long going down slope.

At least one employee has suffered soft tissue injury to his knee as a result of carrying such loads in soft sand. Achilles tendon injuries are often a risk from the combination of soft sand and slope with heavy loads, as are injuries to the shoulders and neck.

- **Attack from animals in the nesting bow** – There are many hazards with opening a box in close proximity to the employee. As the employee was positioned on the same tree as the box there is high potential for snakes, spiders and goannas to inflict injury. On two occasions, aggressive venomous snakes were encountered. Employees are also at risk from falling whilst trying to avoid such hazards.
- **Falling From Heights** – this is the biggest risk and had been resulted in climbing harnesses and ladder anchoring as a solution. However the risk has not been entirely eliminated with it often being hard to get sufficient anchor points for the fall arrest devices, difficult to perform a rescue if the person does fall, striking other trees or equipment when falling and the remote nature of the site.

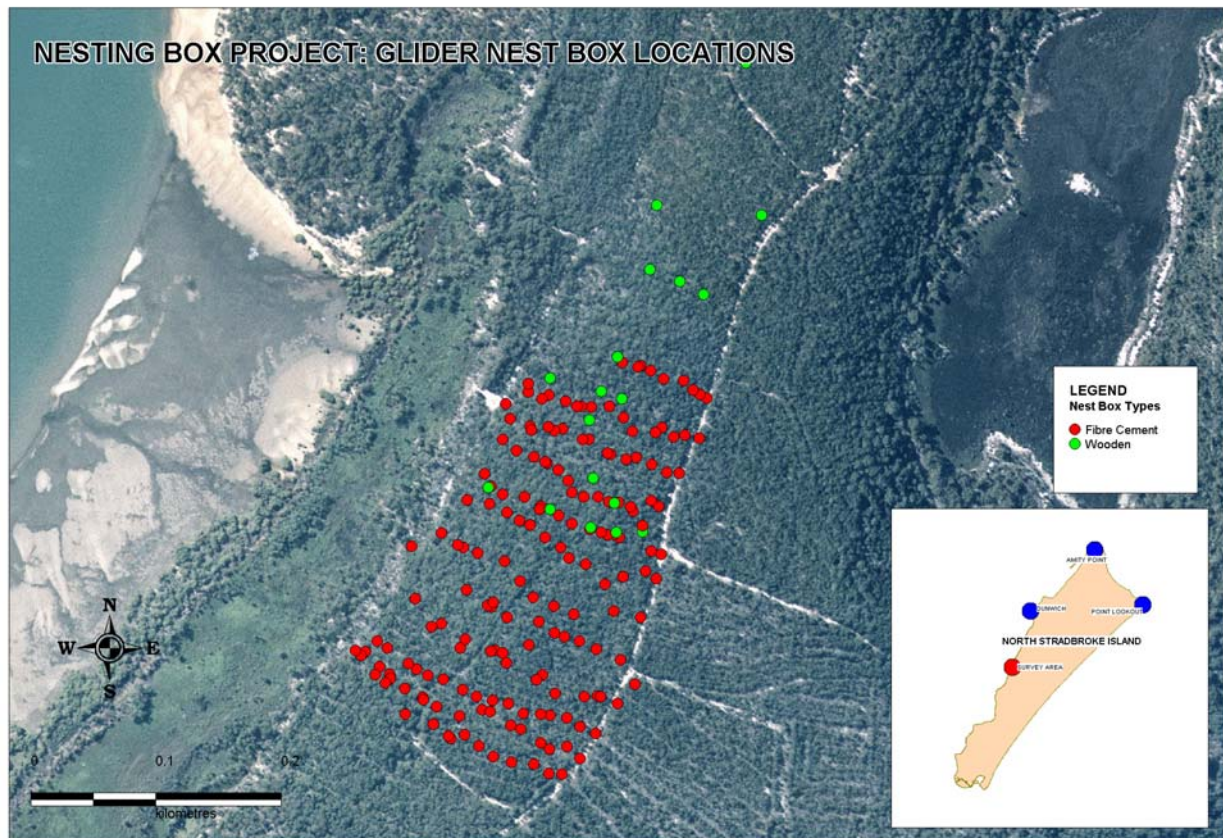
Figure 1: A typical nest box inspections using the old techniques.



Figure 2: Snake found in nesting box whilst using traditional inspections methods.



Figure 3: Location of Nesting Boxes on Rehabilitated Dunes, Bayside Mine



The Solution

Rather than using manual means to identify fauna in nesting boxes, a remote system was developed. It included:

- 20 metre submersible colour camera – chosen due to the built-in LEDs on the camera to shine down into the nesting boxes for identification;
- 10 metre cable – to reach up into any nesting box;
- Light weight, telescopic pole to 6 metres – again to reach up into any nesting box;
- Small, hand held MP4 player – with 2.5" screen to view & record data; and
- Carry bag – to carry all equipment whilst using in field.

This is illustrated in Figure 4.

Figure 4: Using Remote Camera to Identify Fauna in Nesting Boxes.



Benefits/Effects

Much of the risks associated with this task have been eliminated. The following improvements are now in operation:

- A much simpler and safer process has resulted in the task being able to be carried out on a more regular basis. Task is now able to be completed in much less time;
- Reduction in manual handling of equipment;
- Reduction in muscle fatigue, contusions, slips/trips and back injuries;
- Elimination of working at heights for inspections; and
- Reduction in staff required to perform the task safely as one person can operate the equipment.

Transferability Across Industry

The 'Critter Cam' has been trialled and tested in seasonal surveys of the nesting boxes for over a year now. It has proved to be effective in identifying the animals within the small space of the box. The camera would work in any situation where there is a requirement to inspect an object at height, in poor light or confined space. Due to the nature of the equipment, it can also be used underwater for inspection of equipment or aquatic life.

Cost of the original design was minor with the entire apparatus constructions and design being less than \$2000.00

Whilst proving to be an excellent solution to our problem, it has been identified that better technology is available. CRL is currently sourcing a new & improved 'Critter Cam' with a flexible fibrescope camera, an integrated 2.5" monitor with remote control panel mounted onto the telescopic pole, making the equipment more versatile, less bulky and further reducing time taken to identify animals with less intrusion to the nesting box inhabitants.

Innovation and Originality

The 'Critter Cam' is an effective solution to a time consuming and high-risk task.

By eliminating this risk, we have reduced the potential for soft tissue and fall from heights injury. It has also made a task that often took many weeks to complete with two persons, into a 3-4 day single person operation.

This has allowed CRL to continue the project and conduct more rigorous scientific assessment of the results.