

# RFID Enablement

for Forestry in

Peninsular  
Malaysia

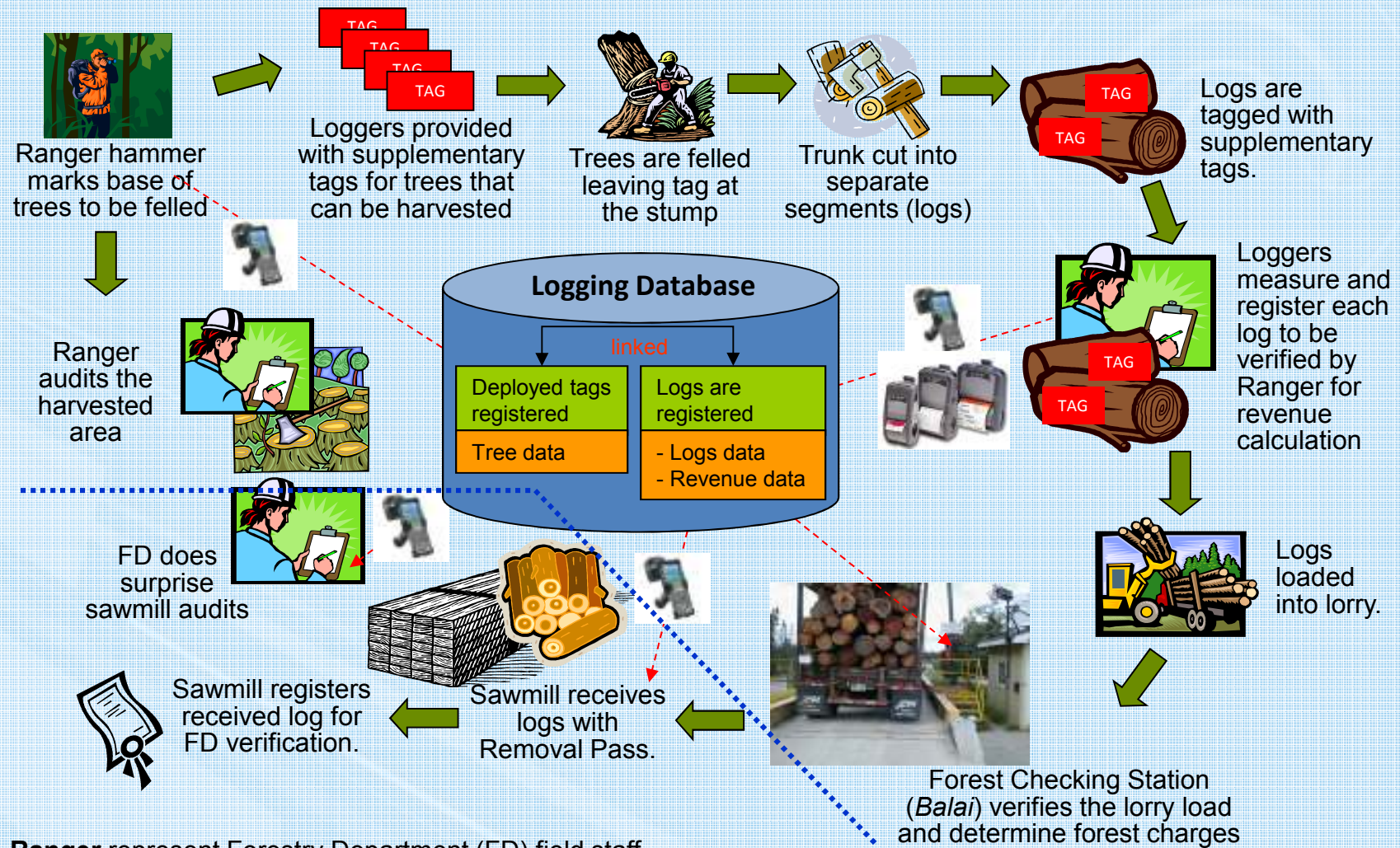


# RFID Trackability Benefit

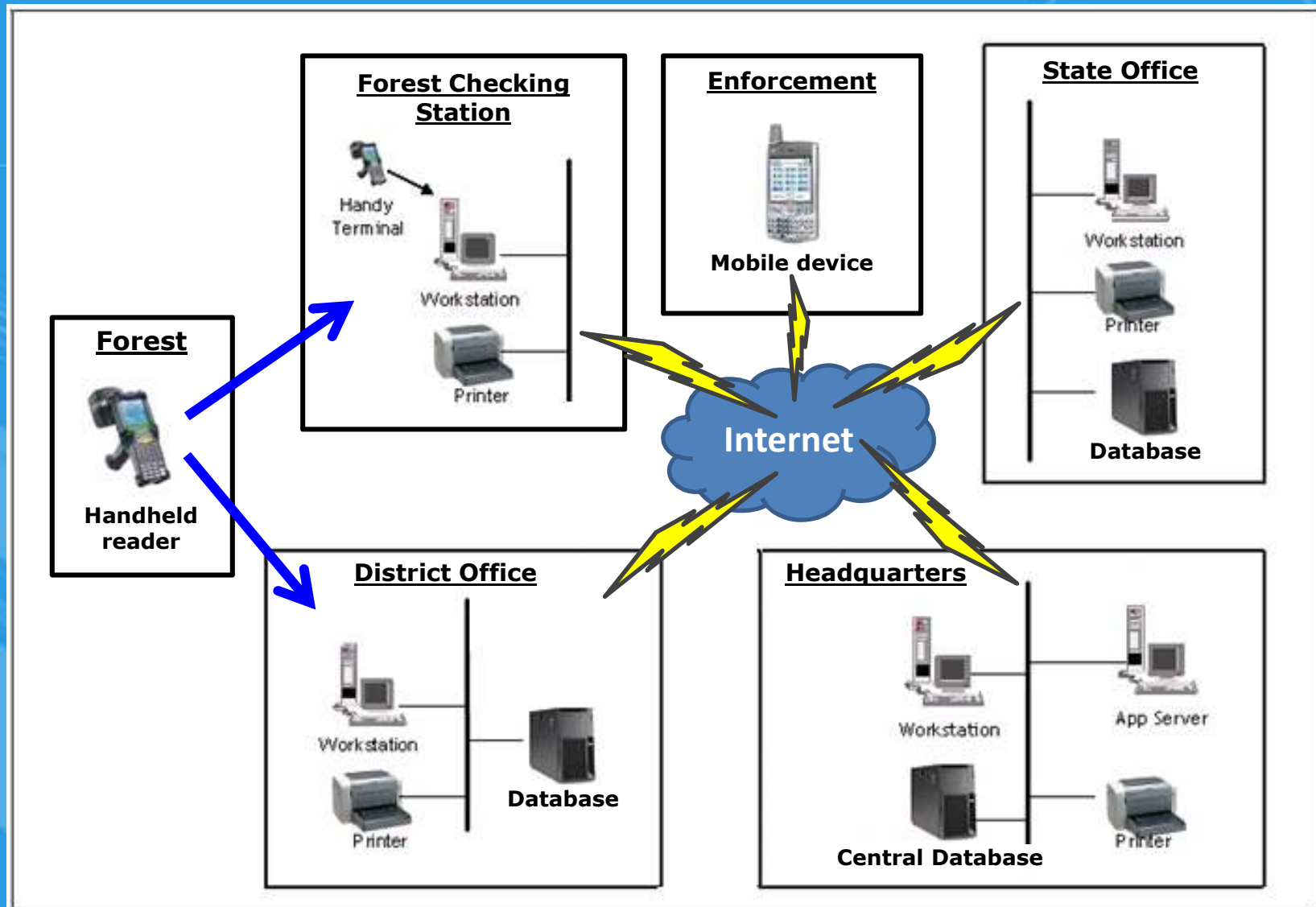
- To provide trackability of logs through flexible data capture of timber movement between forest and processing mills.
- To reduce unauthorized or illegal logging through full traceability on the origins of each log as well as downstream products.
- To increase Forestry Department revenue collection.
- To provide information and detection for any illegal timber.
- To enhance efficiency of forest management and environmental protection.
- To implement system with accurate analysis for forest management planning.



# RFID Architecture Overview



# Overall System Architecture



# Application System Solution



## Log Identification System

- Registration
- Movement tracking
- RFID tagging

IDForest-Log

## Forestry Application System

- Permit or license issuance
- Monitoring
- Reporting
- Inquiry
- Revenue collection



IDForest-App



## Mill Identification System

- Packaging and distribution
- Movement tracking

IDForest-Mill

## Forestry Integration Link

- The EAI (Enterprise Application Integration) component enables integration with FD system



IDForest-Link



## Mobile System

- Data entry
- Checking & verification
- Enforcement
- Alert and notification for any discrepancy

IDForest-Mobile

## Data Warehouse/Business Intelligence

- Centralized database
- Business intelligence
- Executive information for FD officers and management



IDForest-DWBI



# Present Tagging and Marking



# RFID Tagging Process



Ranger attached RFID tag at the stump



Ranger attached RFID tag at logs using long knife (*parang*)



Ranger scanned RFID tag to retrieve RFID number

- Tag No.
- Block No.
- Tree No.
- GPS
- Diameter
- Species Code
- Est. Log Qty
- Log Quality
- Remarks



Data entry using handheld reader



# Reading Performance





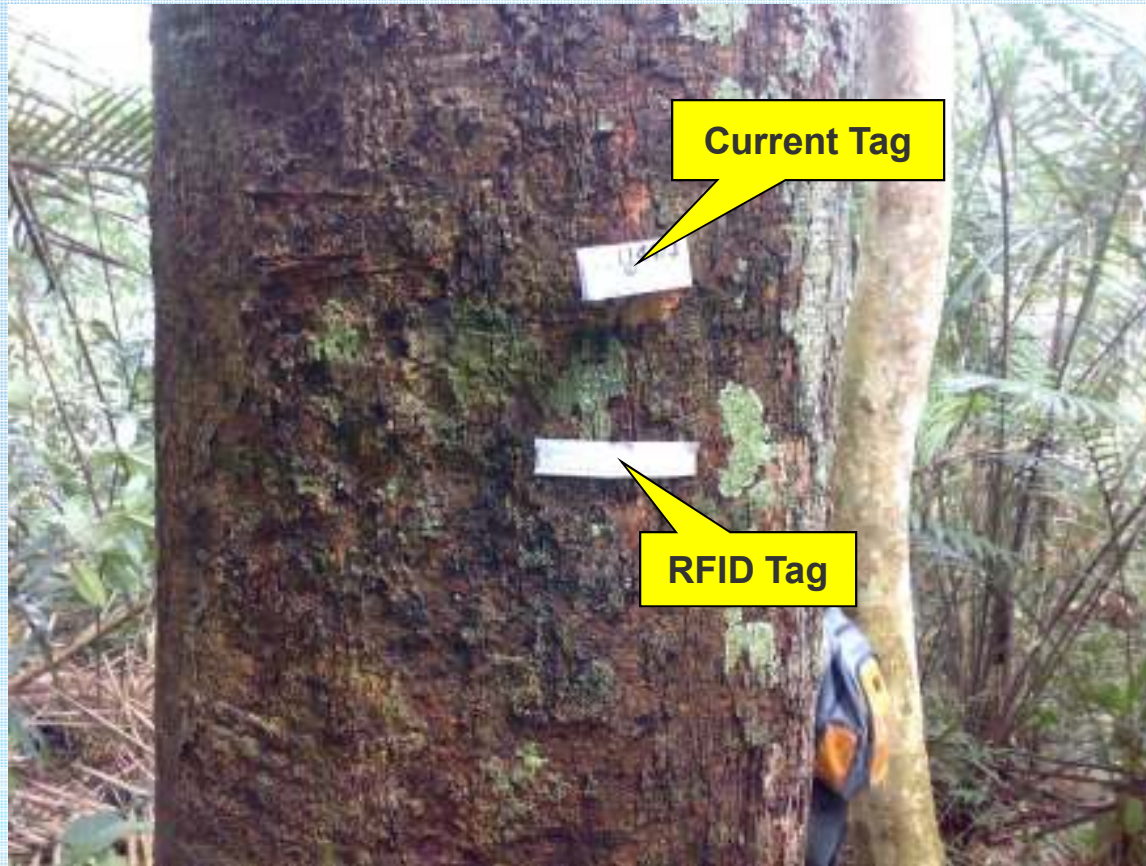


## Findings - Stump

Normal Reading Distance:

- Inside forest shade – 27cm
- In the open – 40cm to 100cm



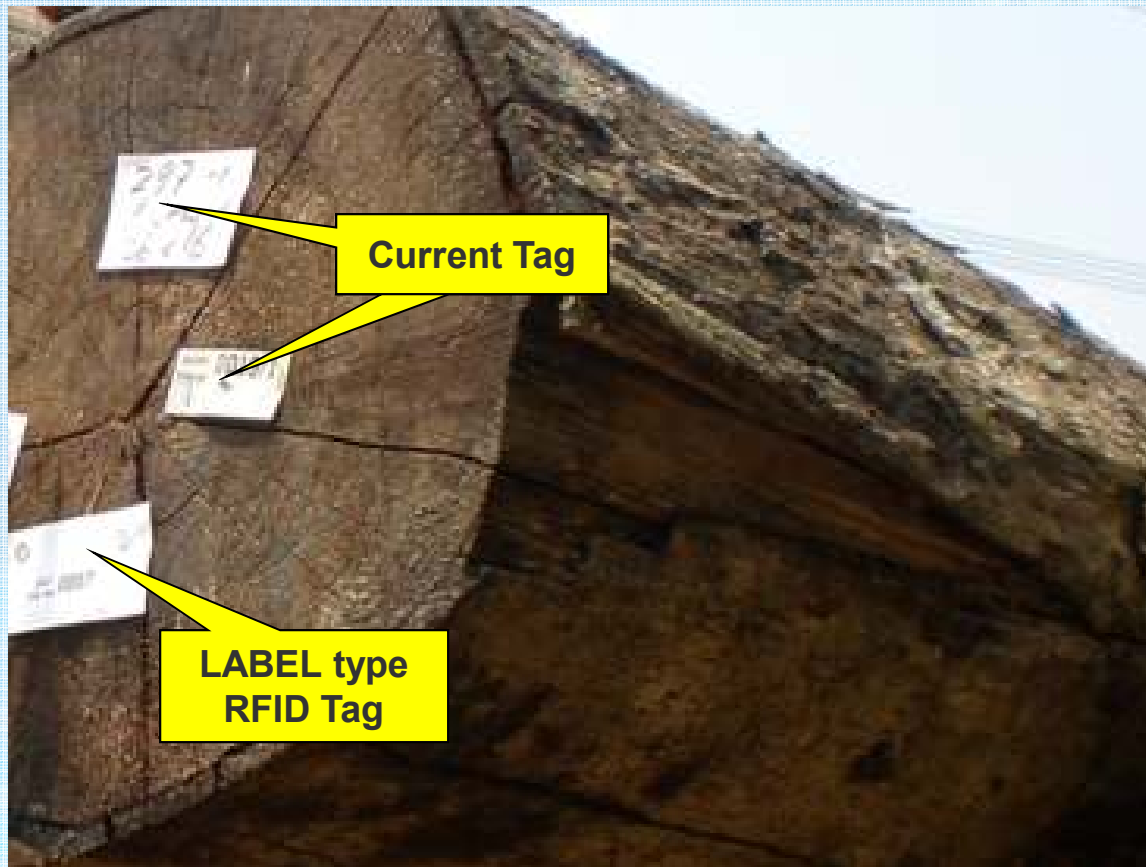


## Findings – Before Felling

Normal Reading Distance:

- Inside forest shade – 25cm
- In the open – 30cm to 80cm





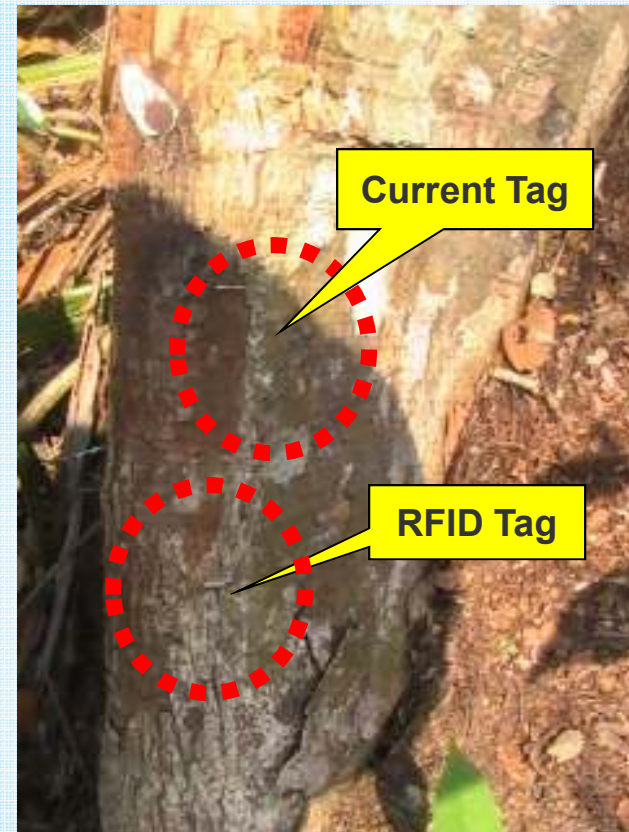
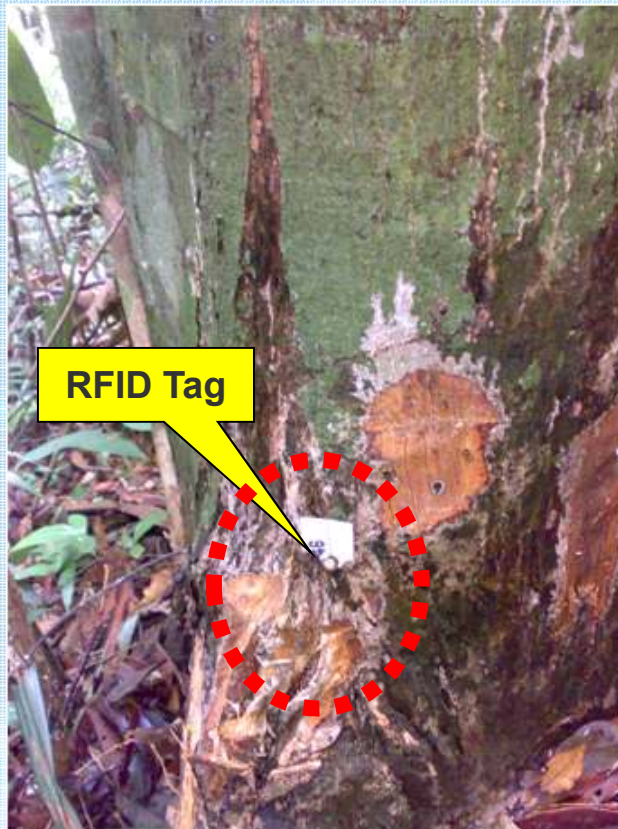
## **Findings – Log (using Label type RFID tag)**

Normal Reading Distance:

- Logs Depot (*Matau*) – 20cm to 30cm
- Inside forest shade – 20cm



# Findings - Identified Problems



- RFID tags destroyed by rodent or monkeys
- Proposed to use RFID tag made from high quality materials (PET, PP or PVC)



# Type of RFID Tags



**PET** (Polyethylene Terephthalate)



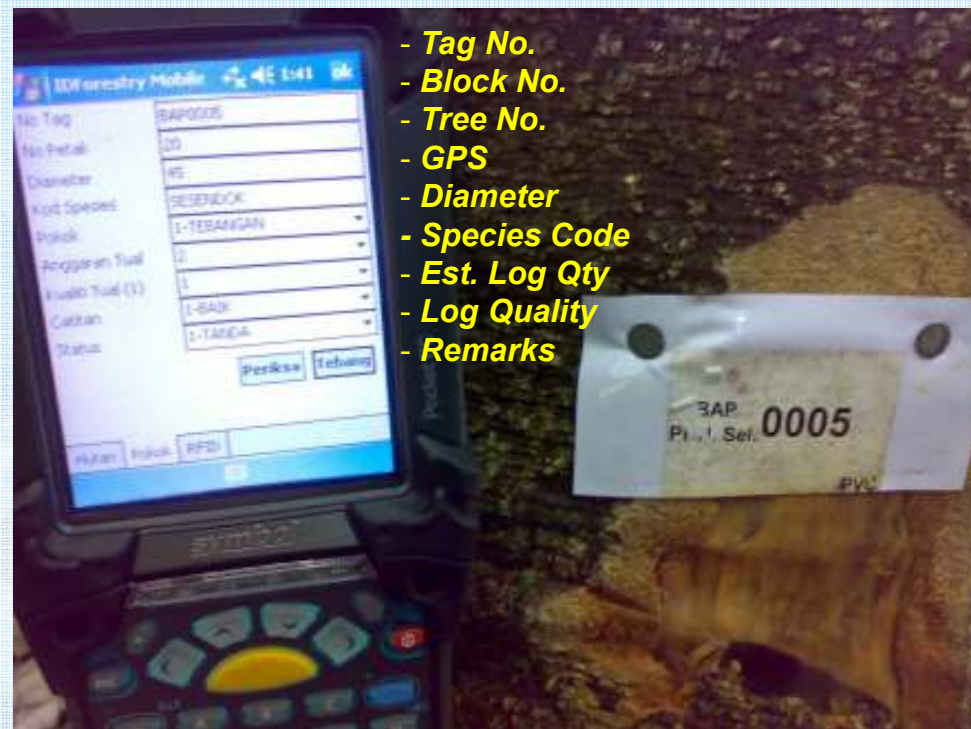
**PP** (Polypropylene)



**PVC** (Polyvinyl Chloride)

# Handheld Application

- To add new data and information
- To retrieve information
- To update data and on-going activities
- Data integrity and information accuracy are the most important (host always right).





# Desktop Office Application

## Laporan: Pas Bagi Memindahkan Hasil Hutan.

Mula Proses Hasilkan Laporan Administrator

Sila masukkan data-data yang diperlukan seperti di bawah.

**Pemandu:** Sudir  
**No. K.P.N.P.H:** 8989  
**Alamat:** Taman Kumala  
**Balai Pemeriksa Jabatan Hutan:** Kuala Kubu Baru  
**No. Kompartment:** 10B  
**No. Lesen:** US/HS/5/2005/BALAK  
**Pemegang Lesen:** PER HOK LAI

**Pilih Tual:** BAD2390/2

Tambah Ke Dalam Senarai

BAD2390/2

\* Klik dua kali pada senarai tual untuk buang tual dari senarai.

# Implementation of Findings

- RFID tag will be able to function properly under the real harsh environment inside the Malaysian forest.
- Improvement of RFID tag
  - Waterproof and non-tearable material  
ie: PET (polyethylene terephthalate), PVC (polyvinyl chloride) and PP (polypropylene)
  - Durability
  - Cost
  - Printer friendly
- Current tool (*parang*) used to attach the RFID tag may damage the chip or antenna. By introducing new tag design, we managed to separate 2 sides between tempered and non-tempered. Ranger have been advised with new SOP on how to attach the RFID tag properly.
- Battery lifetime approximately 12 hours.



# Implementation of Findings

## **Reading Distance at Logs Depot (*Matau*)**

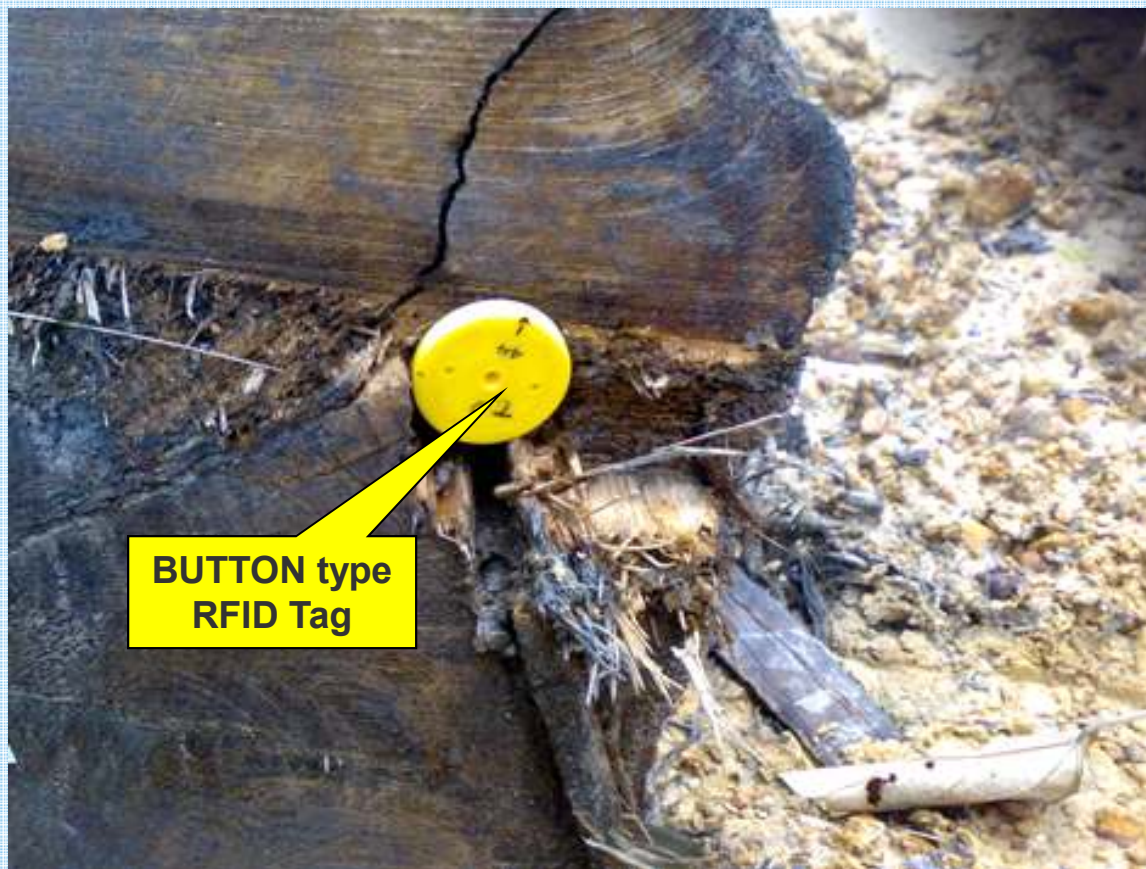
- Each logs have been tagged with different materials (PET, PVC and PP).
- Reading distance between RFID handheld reader and RFID tag shown an average of 1.5 meters.
- This is clear that reading performance and distance are affected by environment and surrounding especially humidity or wetness.

\*Reading distance in control environment between 1 meter to 3 meters.

## **Reading Distance at Marking Area (Trees and Stumps)**

- Trees and stumps have been tagged with different material (PET, PVC and PP).
- Reading distance between RFID handheld reader and RFID tag shown an average of 20 centimeters.
- When the RFID tag is directly attached onto the tree, the reading distance decreases. However when we attached the tag by having some air gap between RFID tag and the tree, reading distance increased to about 40 centimeters.

## Additional Findings



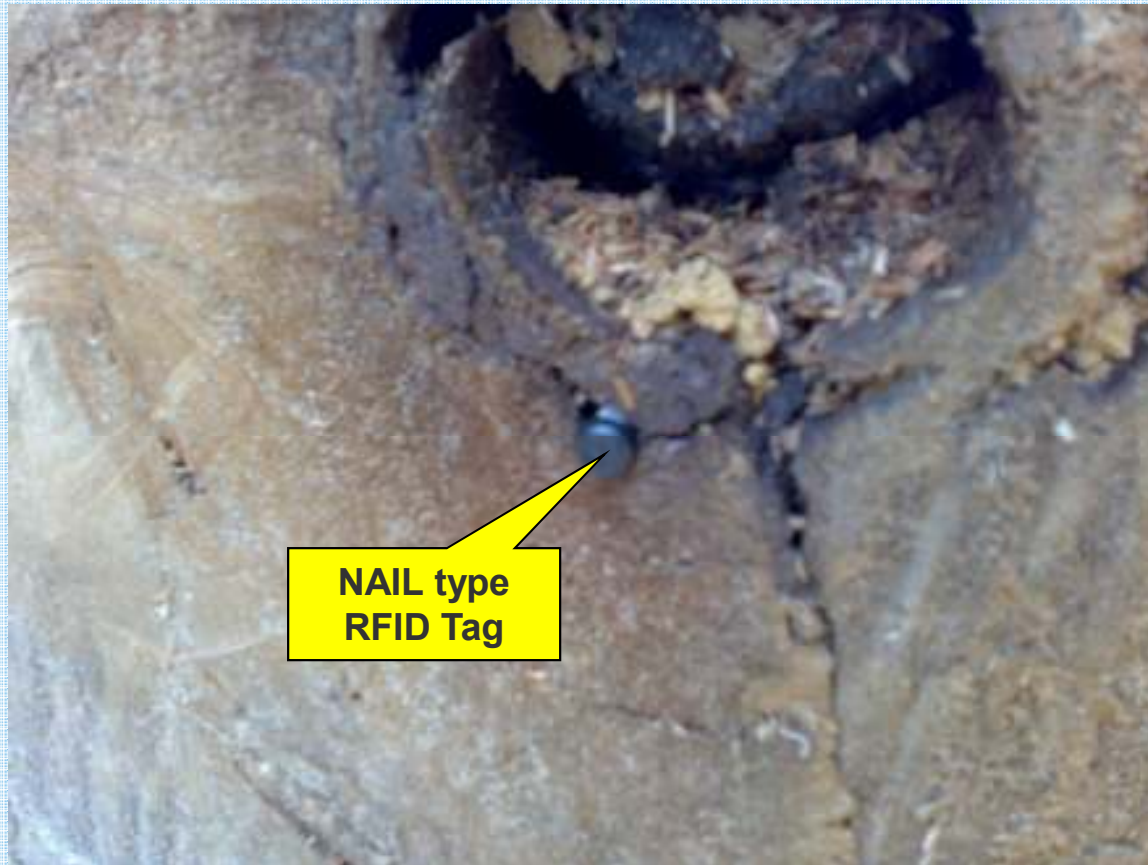
### Findings – Log (using Button type RFID tag)

Normal Reading Distance:

- Inside forest shade – 10cm to 15cm
- In the open – 20cm to 25cm



## Additional Findings



### **Findings – Log (using Nail type RFID tag)**

Normal Reading Distance:

- Inside forest shade – 10cm to 15cm
- In the open – 20cm

# THANK YOU



## Truly Transformational™

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