

Private sector applications of DNA technology

Workshop on Tracking Technologies for Forest Governance

Kuala Lumpur
15 May 2012



DoubleHelix



- The first company to commercialise DNA timber tracking (since 2007)
- Dr. Andrew Lowe
The University of Adelaide, Australia
- Dr. Bernd Degen
Johann Heinrich von Thünen Institut, Germany
- A realistic, affordable approach
DNA IS NOT A STAND-ALONE SYSTEM

Range of levels of DNA differentiation

Individual log traceability

Verify *chain-of-custody* documentation



DNA fingerprinting

Concession origin

Verify *forest* source



Population genetics

Regional origin

Verify *country* source



Phylogeography

Species check

Verify *species*



DNA barcoding

What we set out to do



- Utilise natural genetic information to validate man-made information
- Prove that DNA can be used to independently verify CoC systems
- Demonstrate ease of implementation and cost effectiveness
- Determine value to the private sector

Case 1: ITTO funded Timber Tracking project



2,627 logs sampled



741 logs sampled

Reliable, accurate results



- 14 microsatellite markers used
- 27 out of 32 paired samples matched
- 5 samples did not amplify
- Results peer reviewed and published

High innovation with seamless process



“SF RESOURCES GROUP is pleased to work with Double Helix in Indonesia, in support of CertiSource – developing a DNA system to assist in the tracking for traceability of our timber flow, and which supports ‘verified legal’ timber certification through DNA testing of timber to offer additional scientific proof of Chain of Custody.”

Goh Ah Tee, Chairman

“The process has been seamless in our operations, where the auditor draws the timber sample whilst performing the audit at our log yard.”

Mike Gilding, AGM, Quality Assurance



Case 2: Olam International in Gabon



- Implement DNA verified Chain-of-Custody from harvest through to sawmill delivery
- Build upon existing systems and utilise existing human resources
- Use as model to roll out to 3rd party concessions and 'village cuts'
- Negotiations close to conclusion
- Implementation in July 2012

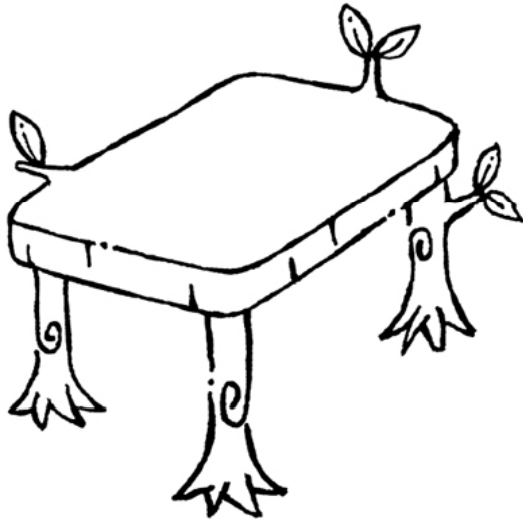
How much assurance does this provide?



Mismatched logs			Chance of detection	
Rate (%)	# p.a.	# p.c.m.	p.c.m.	p.a.
13.4 %	1,274	106	99 %	100.00 %
8.94 %	850	71	95 %	100.00 %
6.94 %	660	55	90 %	100.00 %
4.24 %	403	34	75 %	100.00 %
2.14 %	203	17	50 %	99.98 %
0.90 %	85	7.1	25 %	96.83 %
0.33 %	31	2.6	10 %	71.76 %
0.16 %	15	1.27	5 %	45.96 %
0.03 %	3	0.25	1 %	11.36 %

- 60% of volume verified (4 species)
- Monthly verification
- Unprecedented assurance
Equivalent detection rate of 1 truck per month after 1 year
- USD 0.88 per m³

In summary



- ✓ DNA is universal
- ✓ DNA integrates with and strengthens existing tracking systems
- ✓ Can focus on portions of the supply chain most at risk
e.g. pre-to-post harvest verification
specific species verification
- ✓ Field implementation is simple and fast
- ✓ Affordable, low running costs that continue to fall