ARBORICULTURAL REPORT

9 Castle Drive
Lennox Head

PREPARED FOR:
Mr. Jason Vidler
Shire of Ballina

14/6/2018

Prepared by:
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14/6/2018

Mr. Jason Vidler
Shire of Ballina
P.O. Box 450
Ballina, NSW, 2478

Re: Arboriculture report on Ficus macrophylla at Castle Drive and Ficus macrophylla at Pine Avenue.

1: Introduction

Mr. Vidler has asked Tree Radar Australia to provide root mapping for 2 Ficus macrophylla (Moreton Bay Fig) located at Castle Drive and Pine Avenue. Root mapping is required to establish the extent of the root system to determine any impact on the adjoining properties.

2: Objectives

Accurately identify the root location of the trees to establish what, if any, damage is being caused to the two adjoining properties.

3: Methodology

I inspected the trees on the12/5/2018. Scanning the root system proceeded afterwards and all data down loaded as per specifications.

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4: Site

The site is a large allotment with an established house undergoing renovations. The tree is located at the rear of the house.

5: Results.

The graphs of all root scans are attached to this report

6: Discussion:

Roots are adventitious growers and will grow where and when they can. They do require moisture and a certain amount of oxygen to put on regular growth.

Roots in general, do not grow down as the soil is more compact, dryer and is a much harsher climate to survive. It is generally accepted that all trees have 90% of their root system within the top 1 metre of soil (Harris et al 1993) and they do spread some distance radially from the trunk, in fact up to 2 or 3 times the canopy, (Perry 1982).

Root growth is dependent on soil conditions and species of tree. Ficus species are strong root growers and will usually spread far and wide, which is why they are great survivors and will grow almost anywhere.

The soil at the site is a sandy loam which is easily penetrable for root growth and if there is plenty of moisture available, root growth will be plentiful.

The scans can be read by the depth down the left side of the graph and distance in metres across the top. These scans are a 'virtual' trench and roots can be detected by using the start positions of the scan and measuring the distance along while reading the graph. The actual position reading of the virtual trench would be standing at the subject tree and looking towards the scan line.

The scans show good proliferation within the between 400mm and 600mm which is exactly what you would expect in this soil. Root diameter cannot be ascertained at this stage but newer technology is being established to determine size. All roots detected are over 10mm.

The tree has been in its location before any of the houses were constructed and looking at the lie of the land, some of the excavated soil has been placed over the root system on the house side. It is possible that there are more roots below the 1 metre depth as recorded.

Red squares appear in the graphs and these are abnormal soil conditions such as excavation or rocks. This is particular in scan 14 taken on the excavated driveway.

Scans 15, 16 and 17 were short linear scans taken beside the house and show plenty of root matter. There were some smaller shrubs in this vicinity but not all of the roots detected belong to these smaller plants.

The final graph shows a 3d projected plan of the trees root system. The greater concentration of roots appear to be on the east side of the tree but much of the larger, near surface roots appear on the house side and the scans show a fair amount of roots directly in front of the house.

7: Tree Scanning Plan

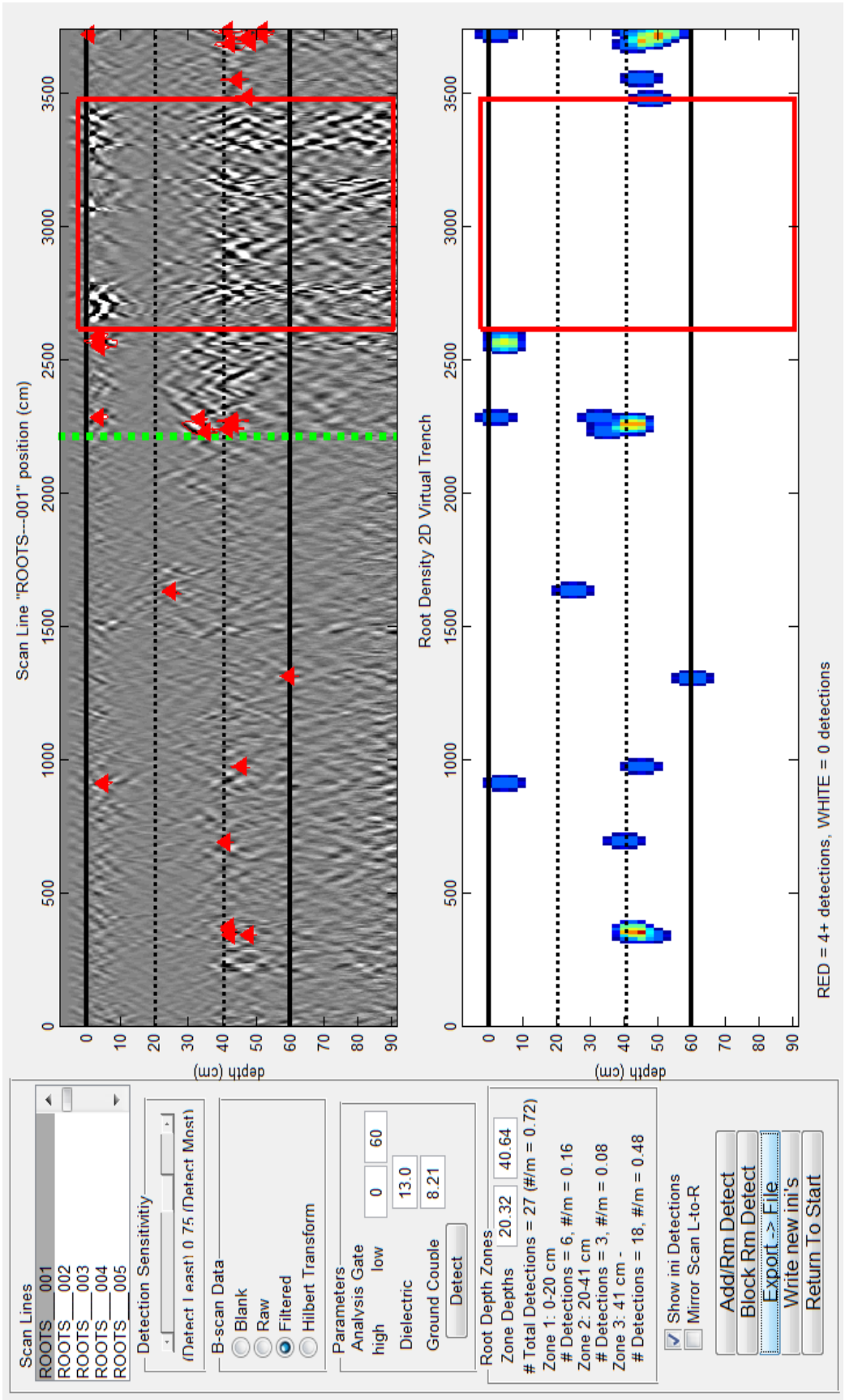
A plan of scans is attached to this report

8: Conclusion

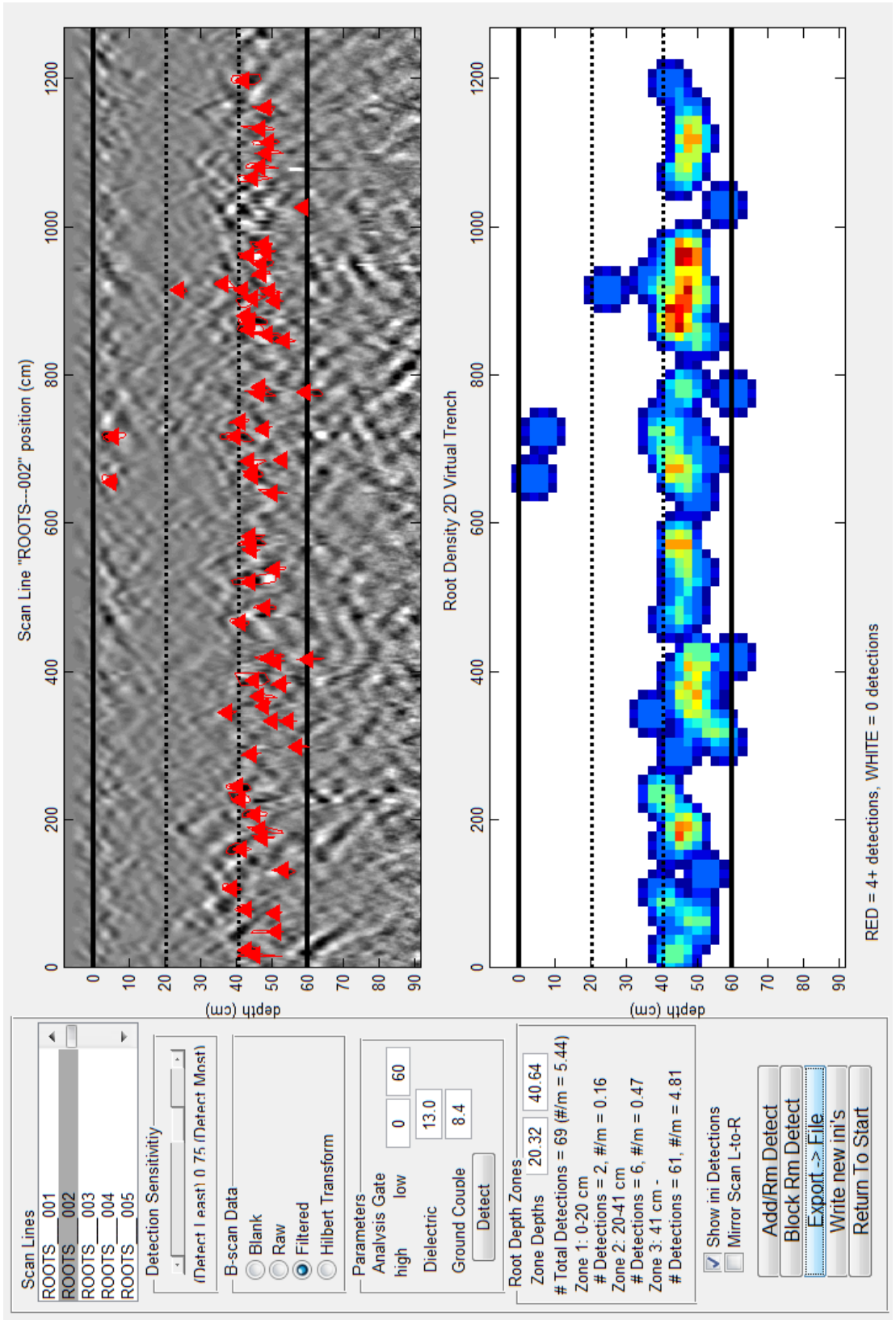
The root mass is extensive as expected for the size of the tree. Roots have been detected at and around the house and would explain some of the cracking walls.

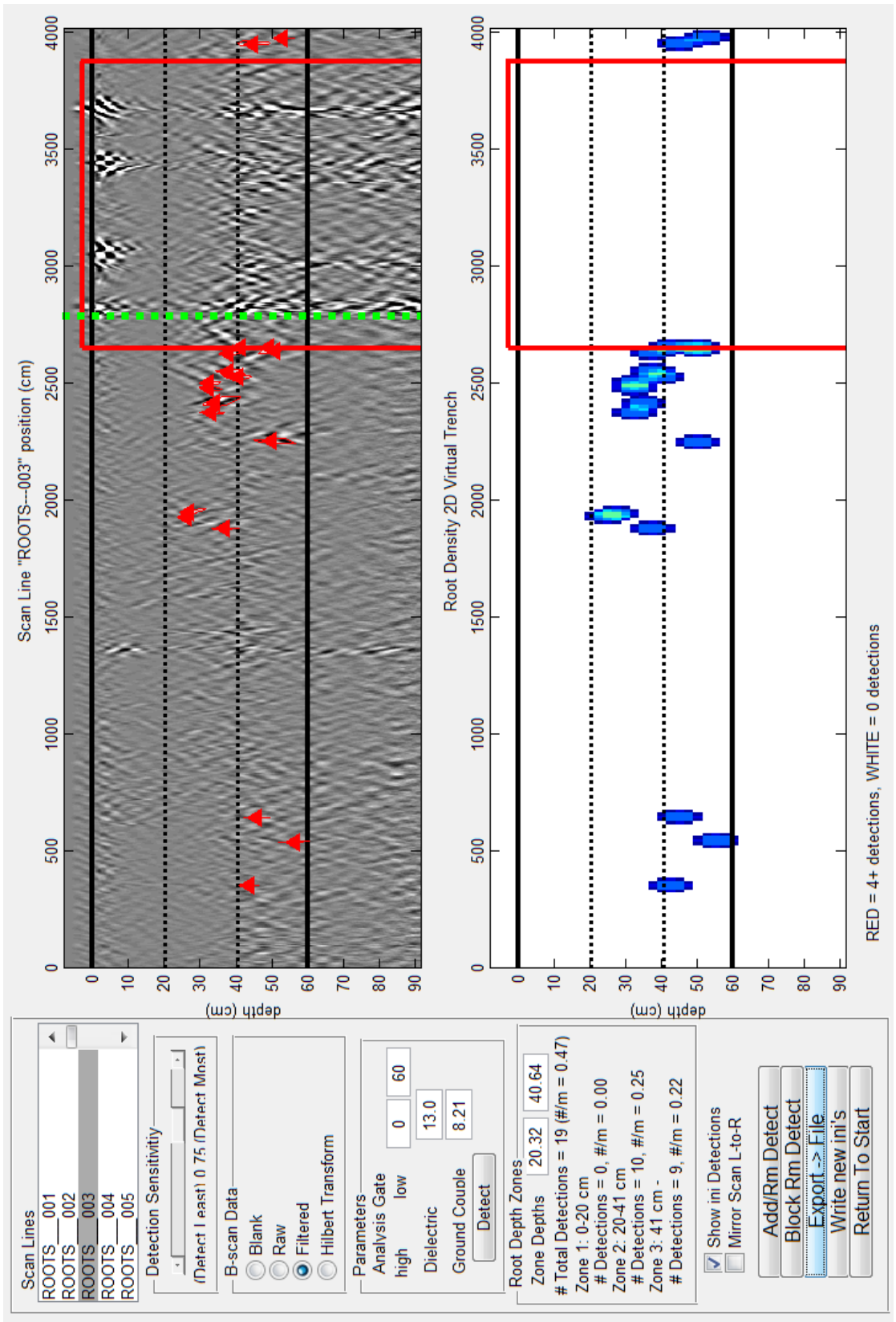
Consulting Arborist:

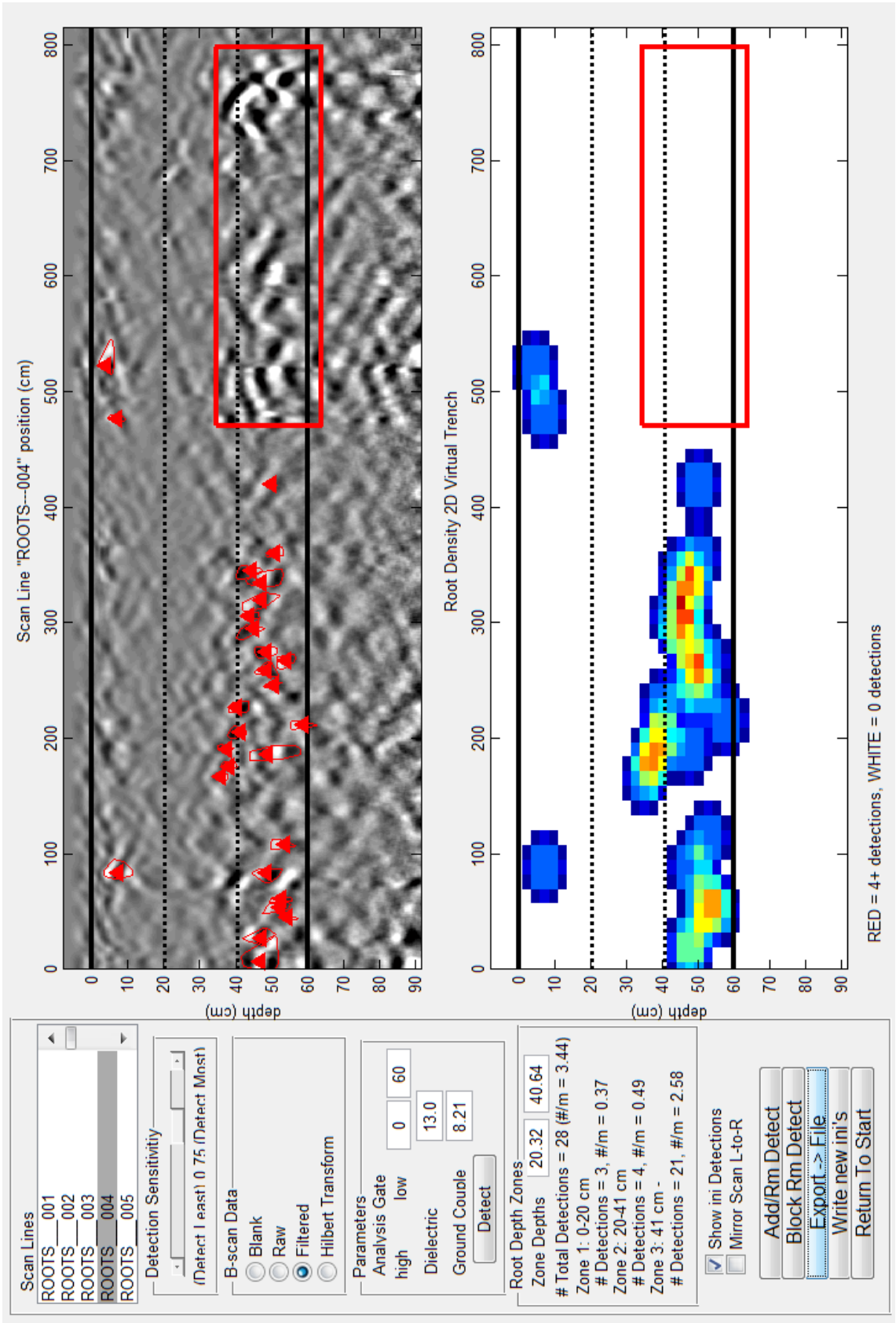
Robert Knott
Adv.Cert.Arb.Burnley



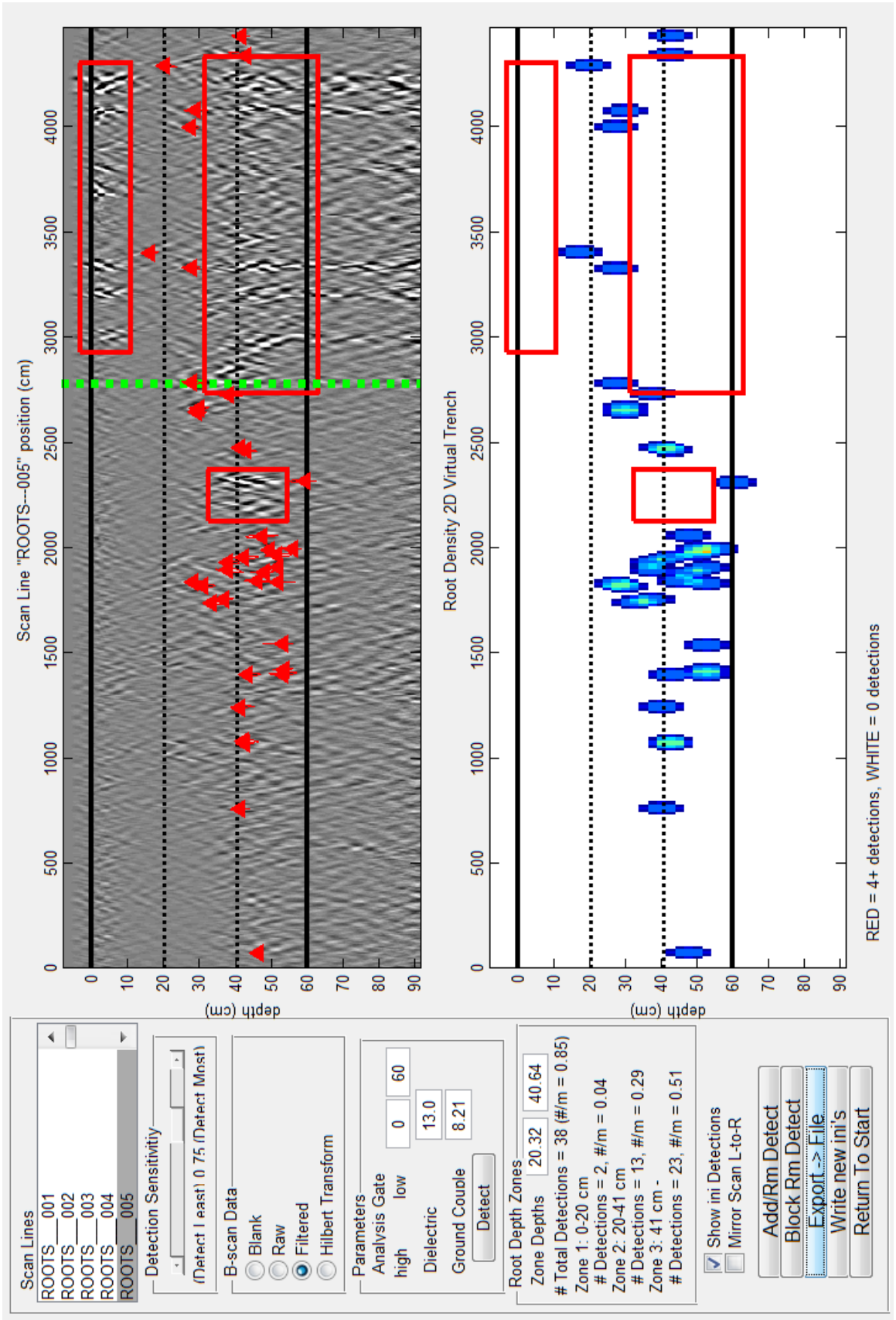
Ballina Shire Council. Lennox Head scans


Scan Line "ROOTS---002" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__001
ROOTS__002
ROOTS__003
ROOTS__004
ROOTS__005
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
8.4
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 69 (#/m = 5.44)
Zone 1: 0-20 cm
Detections = 2, #/m = 0.16
Zone 2: 20-41 cm
Detections = 6, #/m = 0.47
Zone 3: 41 cm -
Detections = 61, #/m = 4.81
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start

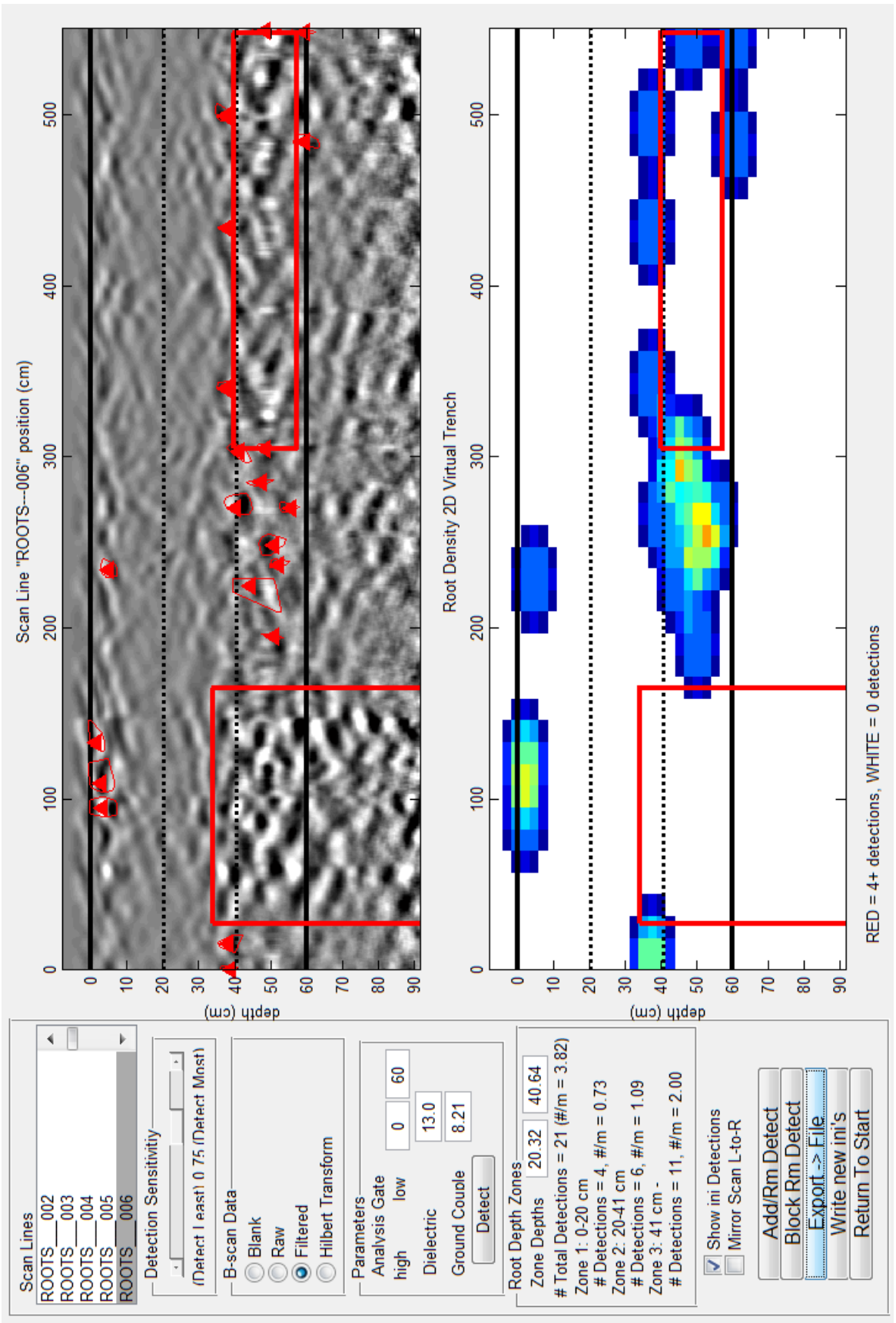

Scan Line "ROOTS---003" position (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__001
ROOTS__002
ROOTS__003
ROOTS__004
ROOTS__005
Detection Sensitivity
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
low
high
Dielectric
Ground Couple
Detect
Root Depth Zones
Zone Depths
Total Detections = 19 (#/m = 0.47)
Zone 1: 0-20 cm
Detections = 0, #/m = 0.00
Zone 2: 20-41 cm
Detections = 10, #/m = 0.25
Zone 3: 41 cm -
Detections = 9, #/m = 0.22
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start



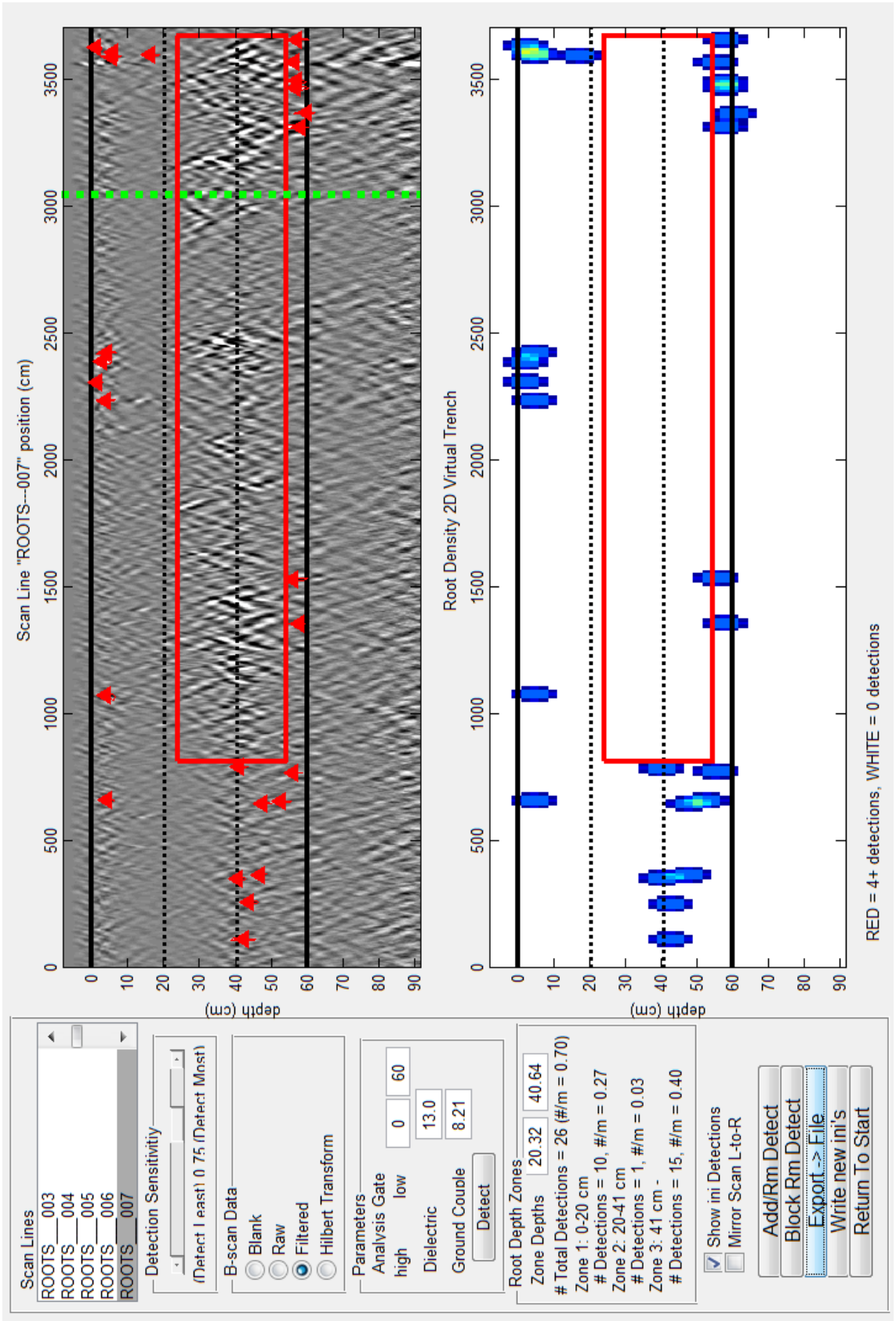
Ballina Shire Council. Lennox Head scans

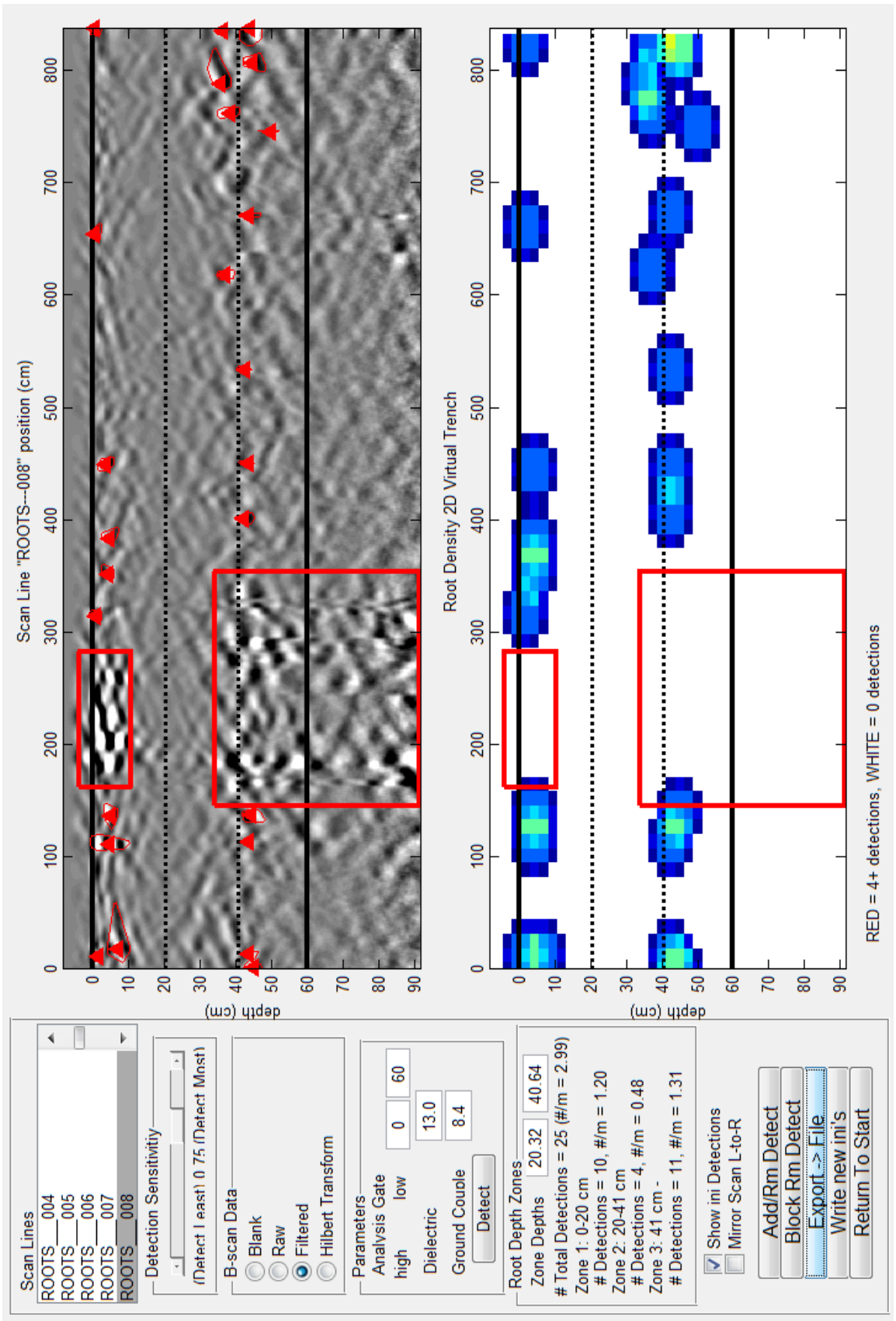


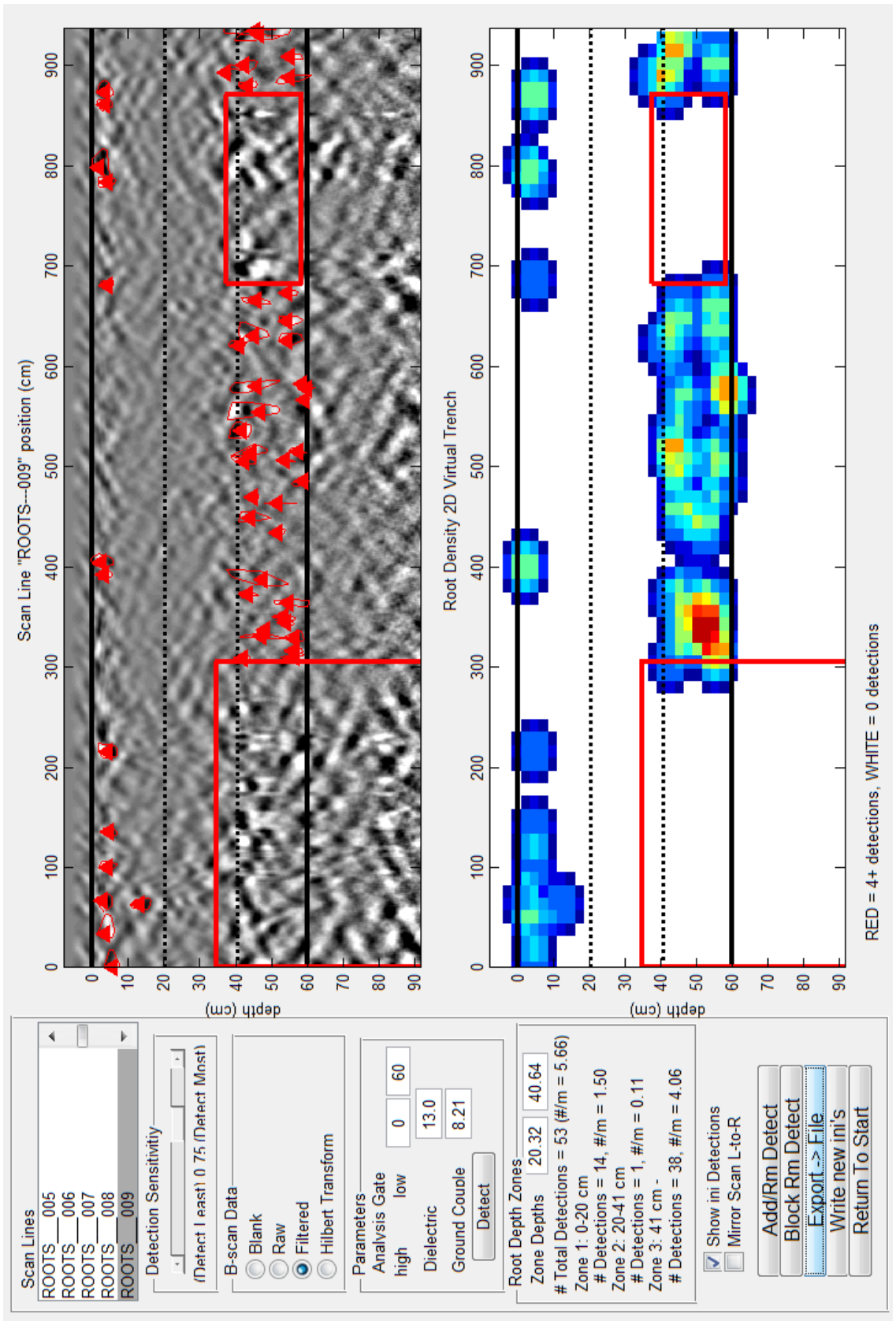
Ballina Shire Council. Lennox Head scans

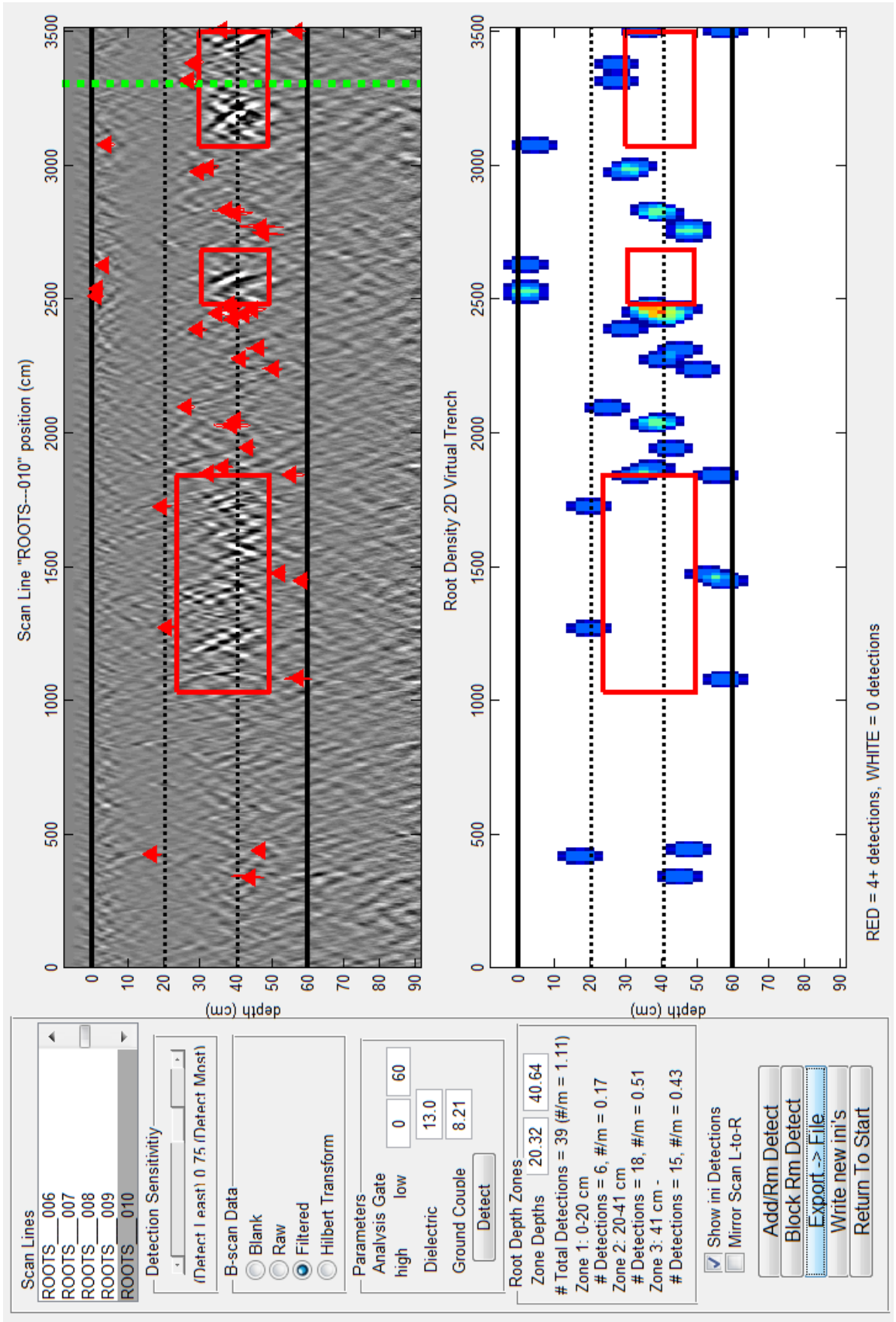


Ballina Shire Council. Lennox Head scans

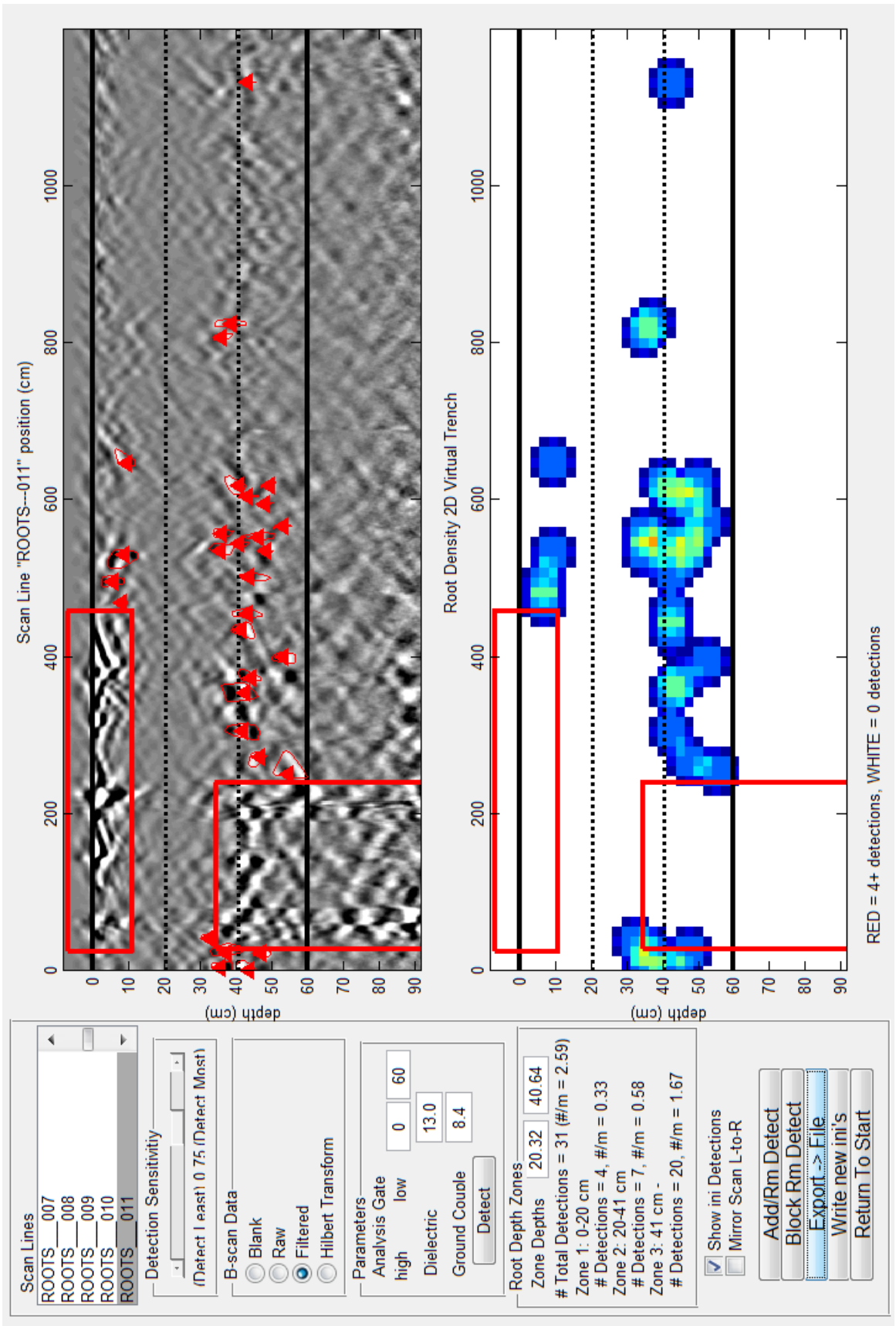

Scan Line "ROOTS---007" position (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__003
ROOTS__004
ROOTS__005
ROOTS__006
ROOTS__007
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
8.21
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 26 (#/m = 0.70)
Zone 1: 0-20 cm
Detections = 10, #/m = 0.27
Zone 2: 20-41 cm
Detections = 1, #/m = 0.03
Zone 3: 41 cm -
Detections = 15, #/m = 0.40
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start


Scan Line "ROOTS---008" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS___004
ROOTS___005
ROOTS___006
ROOTS___007
ROOTS___008
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
8.4
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 25 (#/m = 2.99)
Zone 1: 0-20 cm
Detections = 10, #/m = 1.20
Zone 2: 20-41 cm
Detections = 4, #/m = 0.48
Zone 3: 41 cm -
Detections = 11, #/m = 1.31
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start

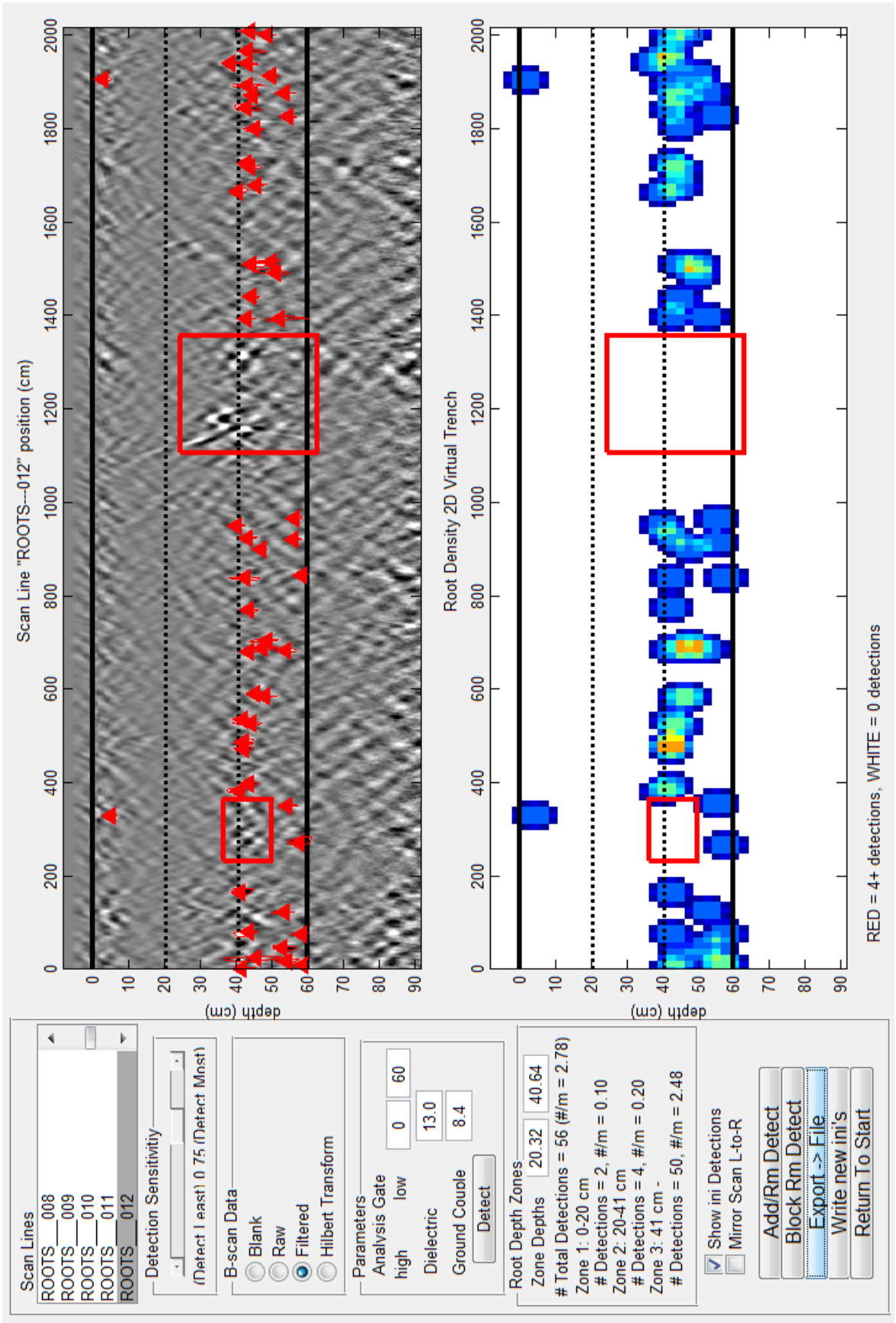

Scan Lines
ROOTS__005
ROOTS__006
ROOTS__007
ROOTS__008
ROOTS__009
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
8.21
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 53 (#/m = 5.66)
Zone 1: 0-20 cm
Detections = 14, #/m = 1.50
Zone 2: 20-41 cm
Detections = 1, #/m = 0.11
Zone 3: 41 cm -
Detections = 38, #/m = 4.06
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start
Scan Line "ROOTS---009" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections



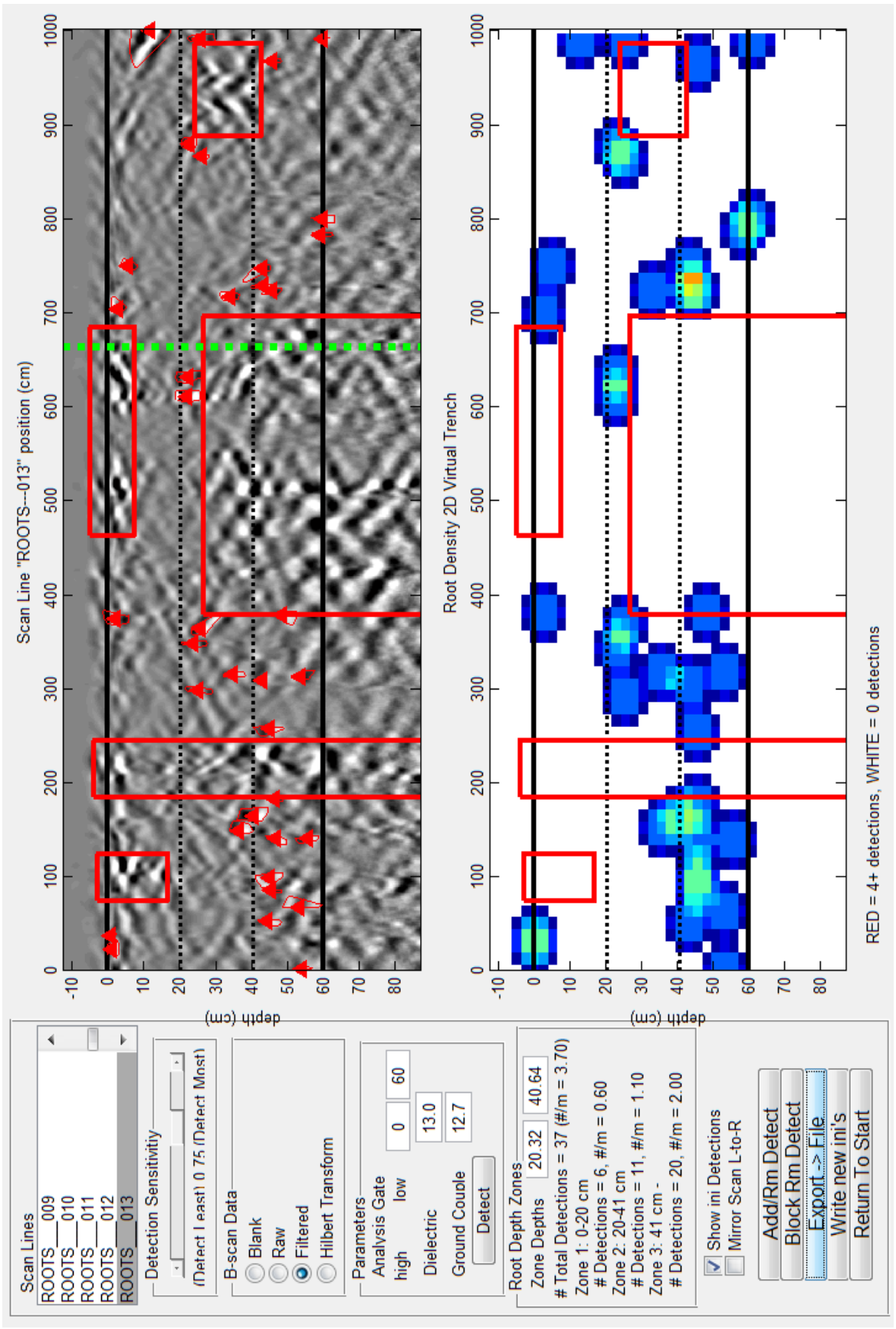
Ballina Shire Council. Lennox Head scans

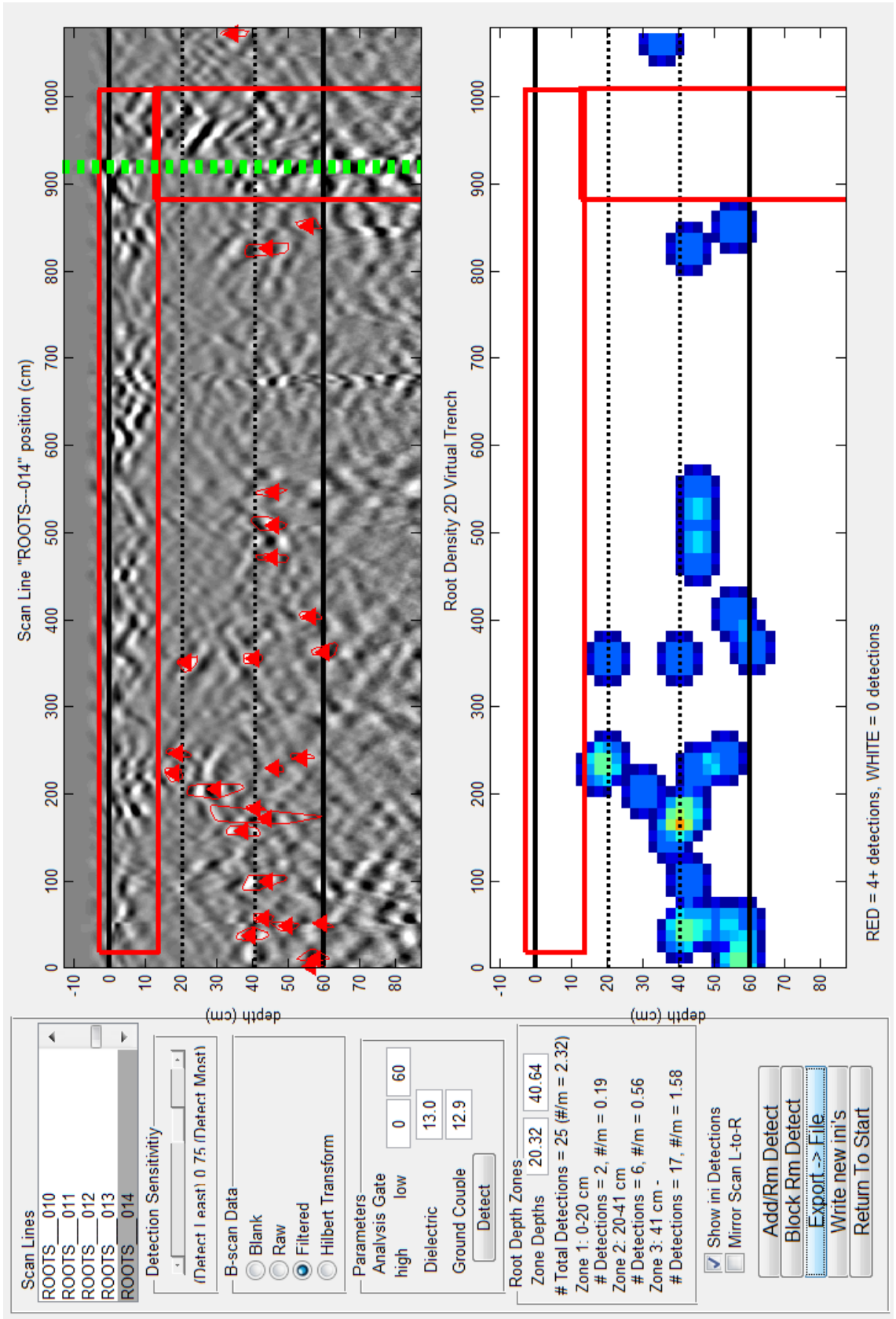


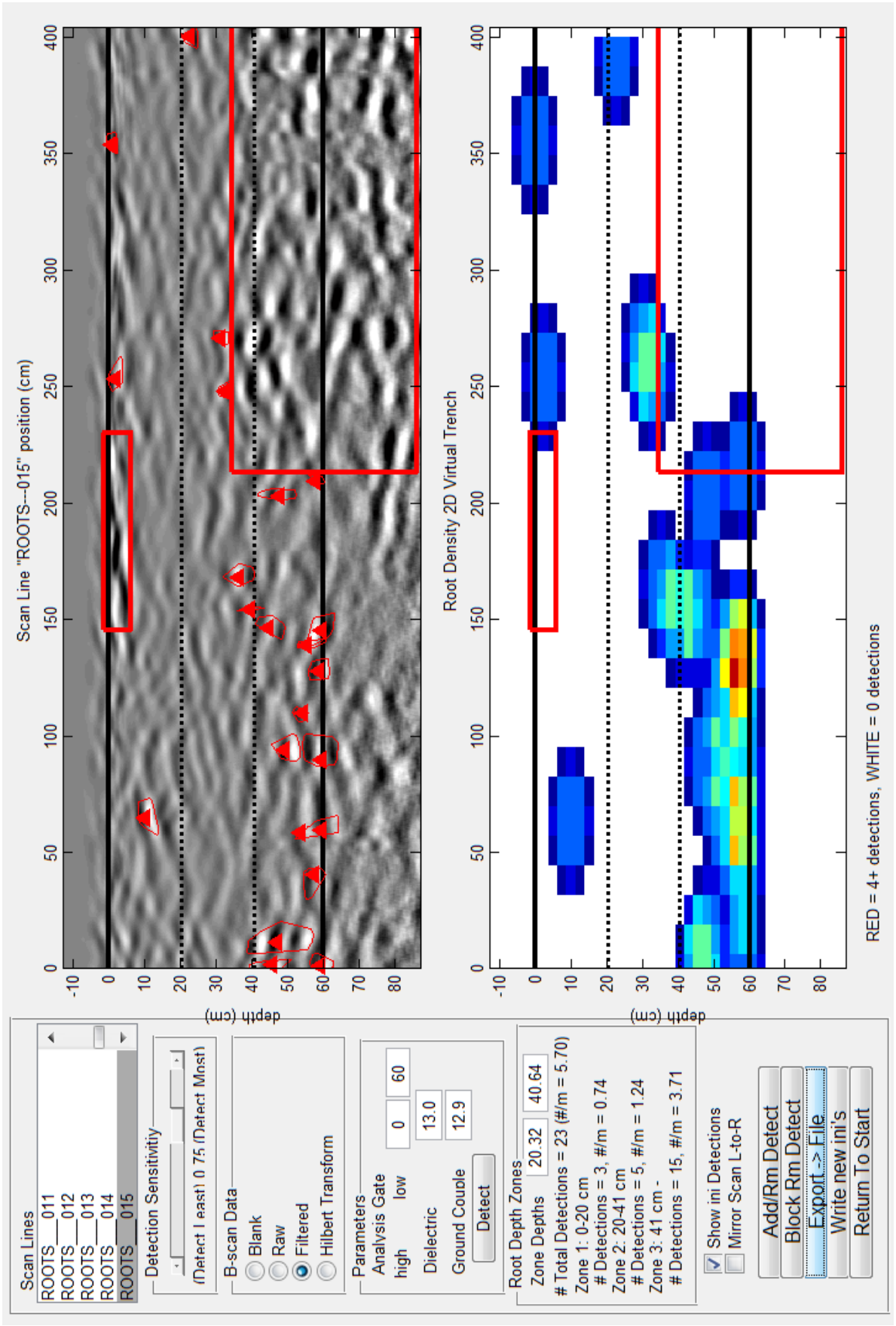
Ballina Shire Council. Lennox Head scans



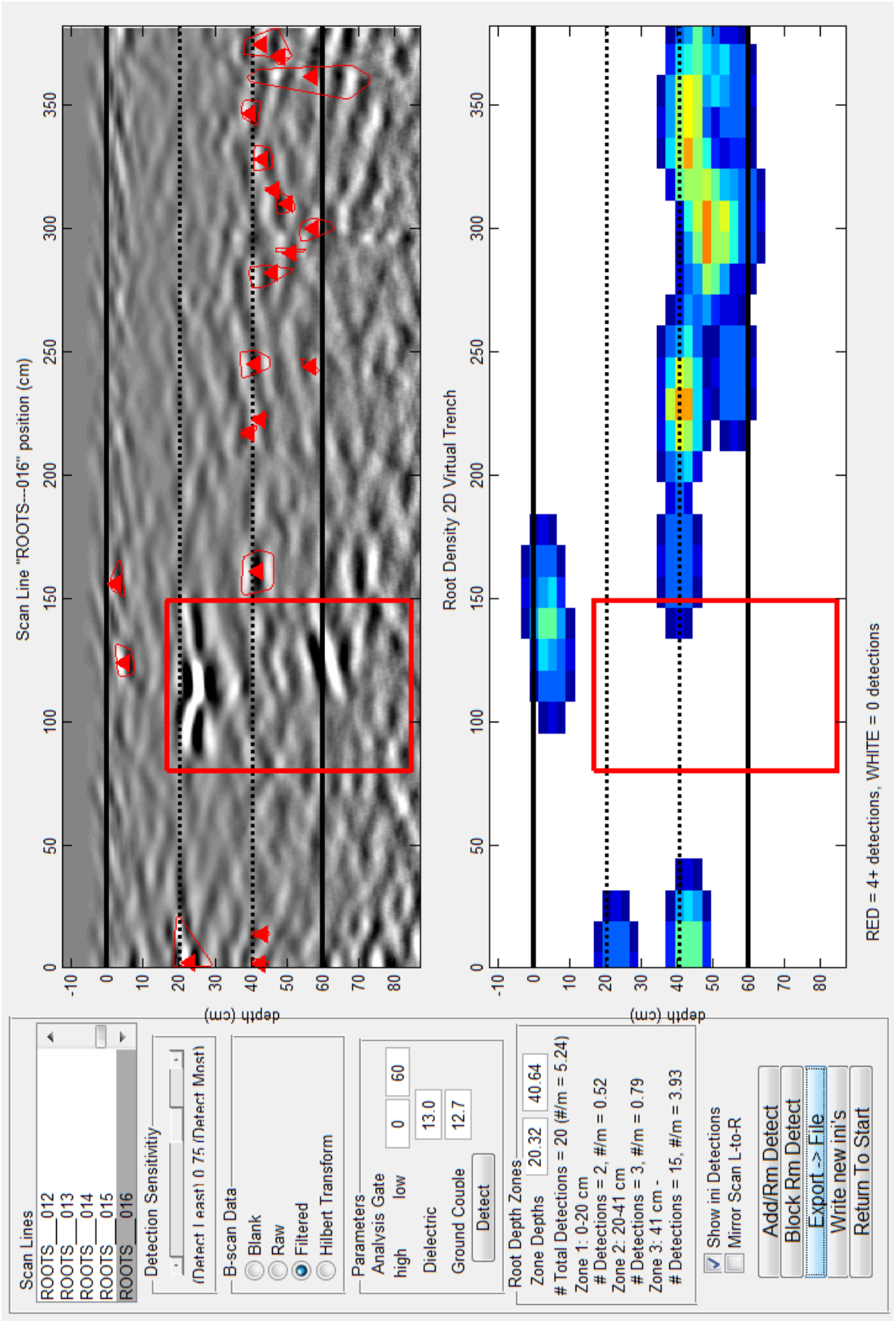
Ballina Shire Council. Lennox Head scans

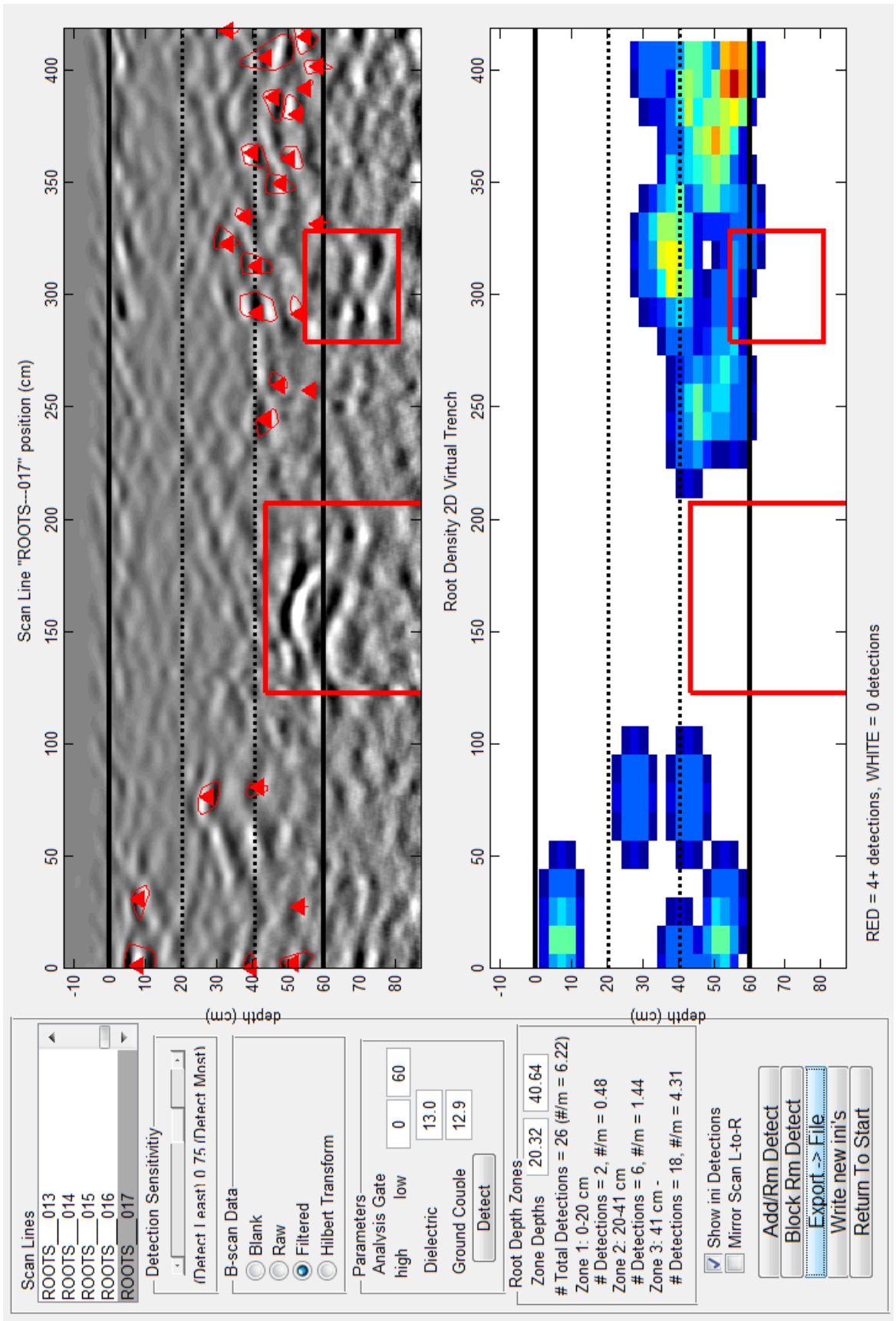

Scan Line "ROOTS---013" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS___009
ROOTS___010
ROOTS___011
ROOTS___012
ROOTS___013
Detection Sensitivitiy
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
12.7
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 37 (#/m = 3.70)
Zone 1: 0-20 cm
Detections = 6, #/m = 0.60
Zone 2: 20-41 cm
Detections = 11, #/m = 1.10
Zone 3: 41 cm -
Detections = 20, #/m = 2.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start

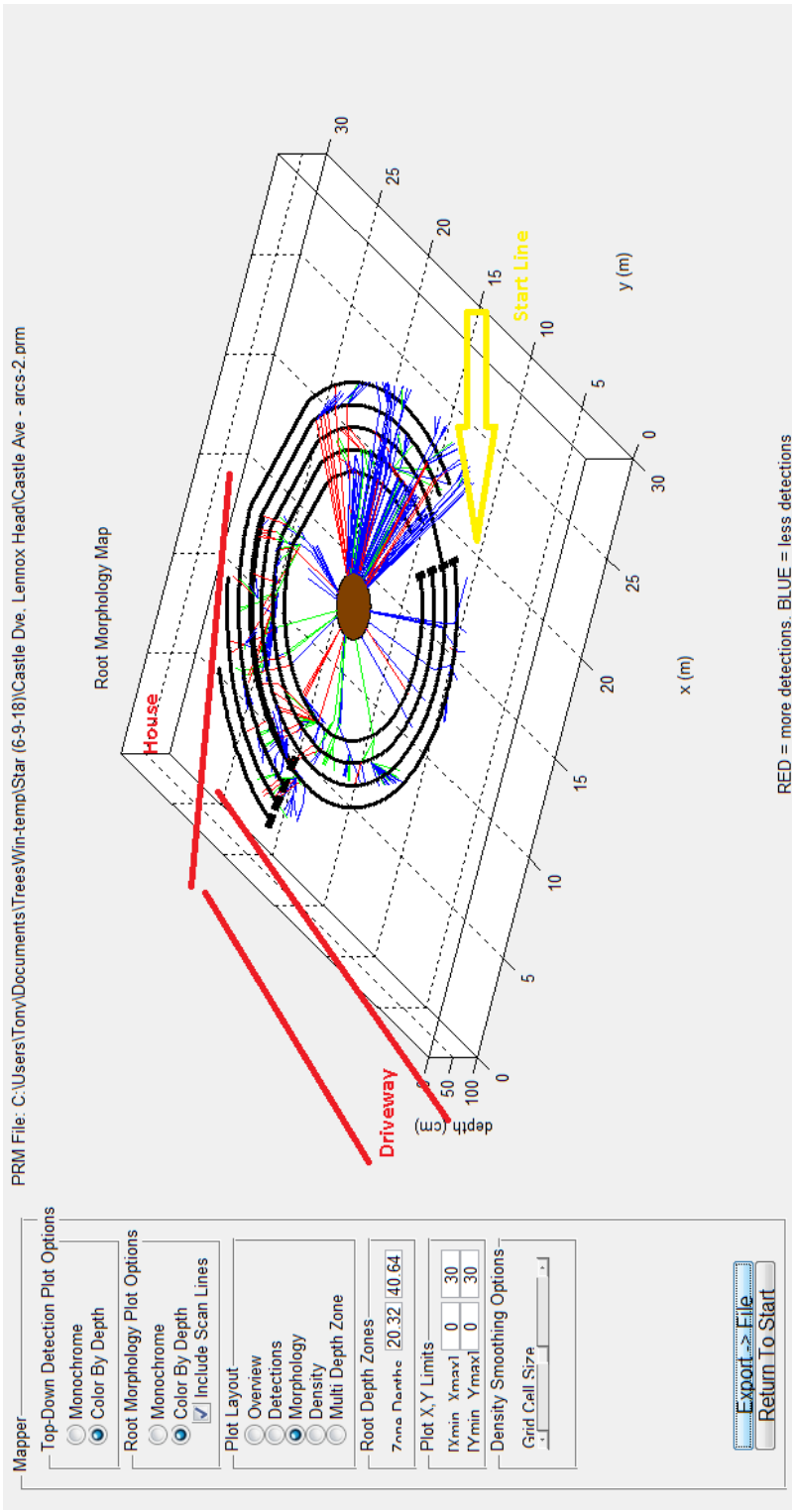

Scan Line "ROOTS---014" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS___010
ROOTS___011
ROOTS___012
ROOTS___013
ROOTS___014
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
12.9
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 25 (#/m = 2.32)
Zone 1: 0-20 cm
Detections = 2, #/m = 0.19
Zone 2: 20-41 cm
Detections = 6, #/m = 0.56
Zone 3: 41 cm -
Detections = 17, #/m = 1.58
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start



Ballina Shire Council. Lennox Head scans

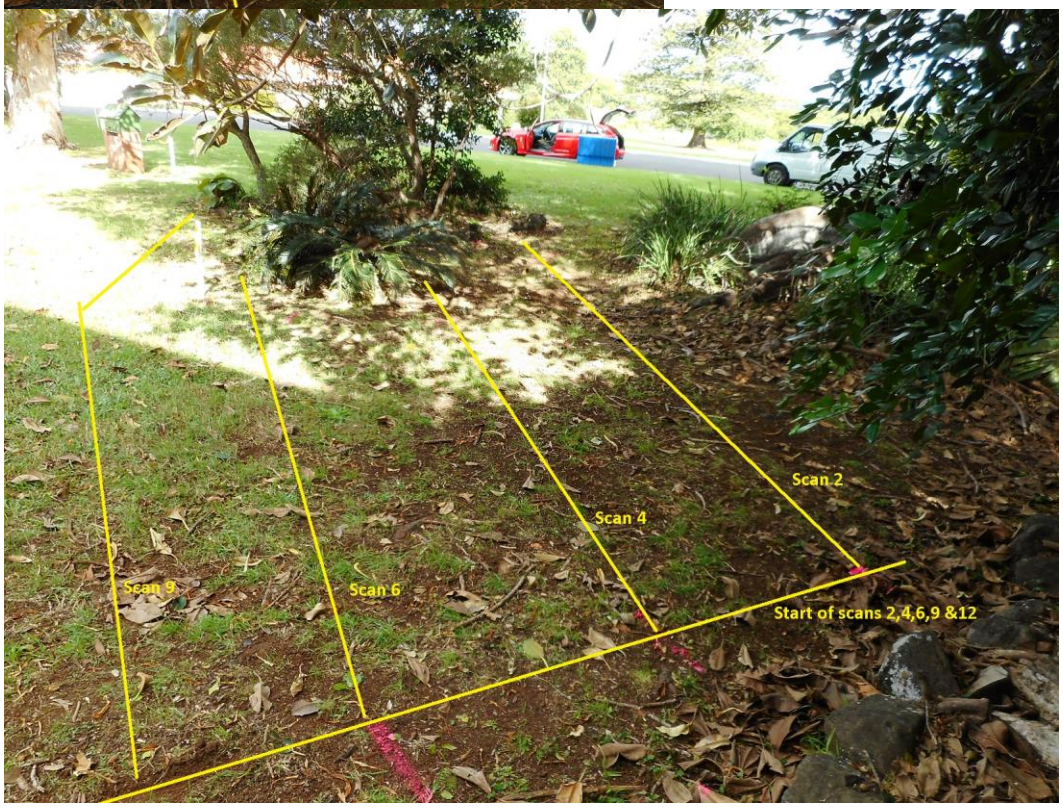

Scan Line "ROOTS---016" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__012
ROOTS__013
ROOTS__014
ROOTS__015
ROOTS__016
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
12.7
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 20 (#/m = 5.24)
Zone 1: 0-20 cm
Detections = 2, #/m = 0.52
Zone 2: 20-41 cm
Detections = 3, #/m = 0.79
Zone 3: 41 cm -
Detections = 15, #/m = 3.93
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start

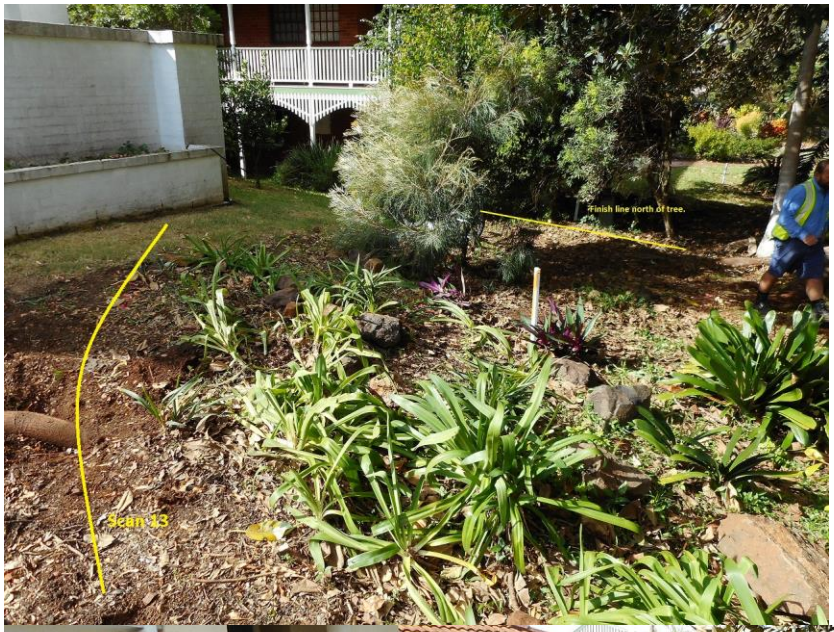

Scan Line "ROOTS---017" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__013
ROOTS__014
ROOTS__015
ROOTS__016
ROOTS__017
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
60
Dielectric
13.0
Ground Couple
12.9
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 26 (#/m = 6.22)
Zone 1: 0-20 cm
Detections = 2, #/m = 0.48
Zone 2: 20-41 cm
Detections = 6, #/m = 1.44
Zone 3: 41 cm -
Detections = 18, #/m = 4.31
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start



3d imaging of the projected root system.


Scan 12


Scan 2
Scan 4
Scan 9
Scan 6
Start of scans 2,4,6,9 &12



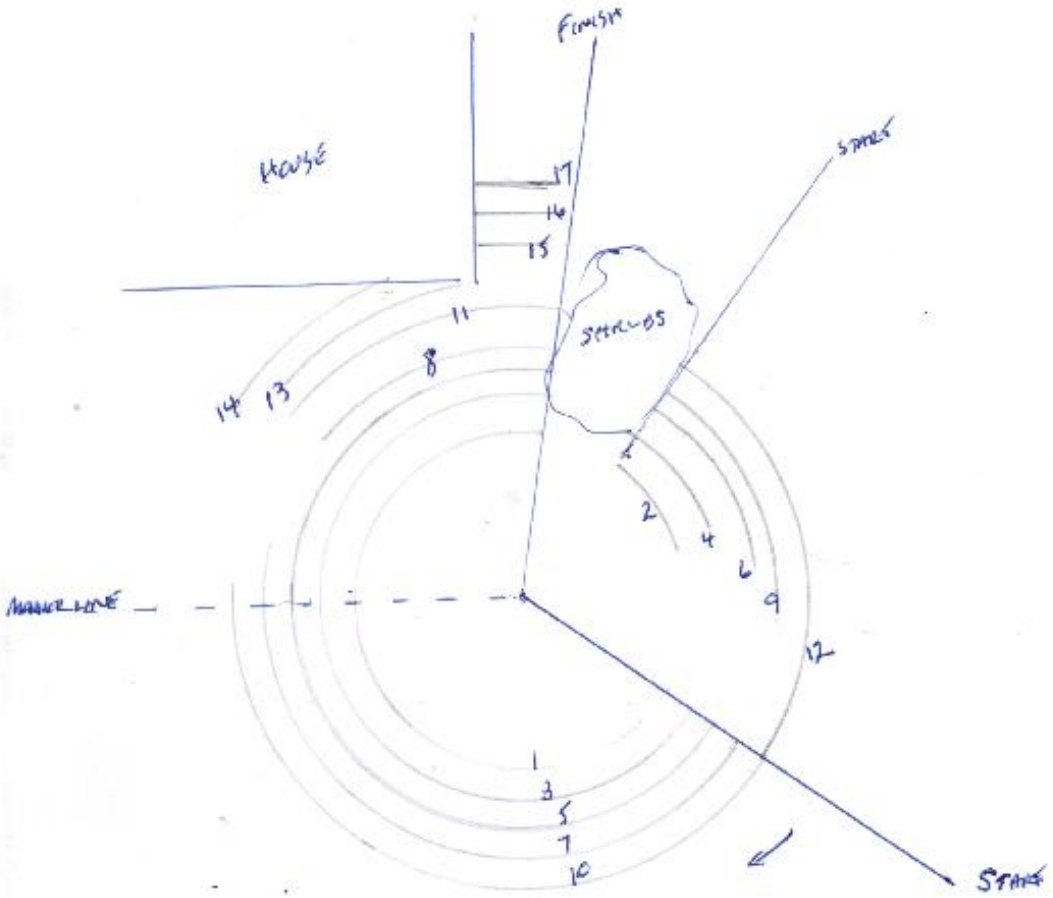
Ballina Shire Council. Lennox Head scans


Marker line


Start line
Marker line

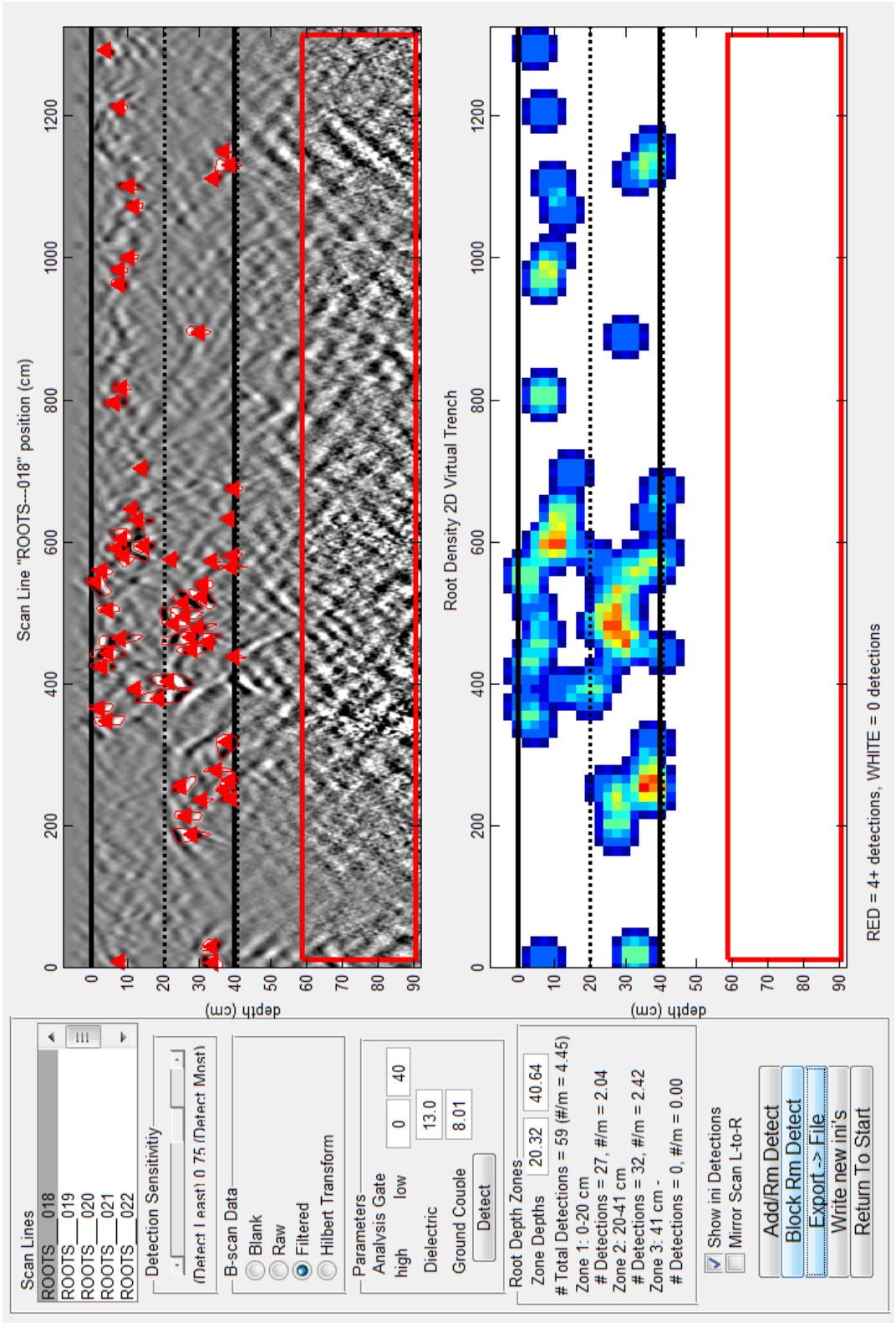

Start of Scans

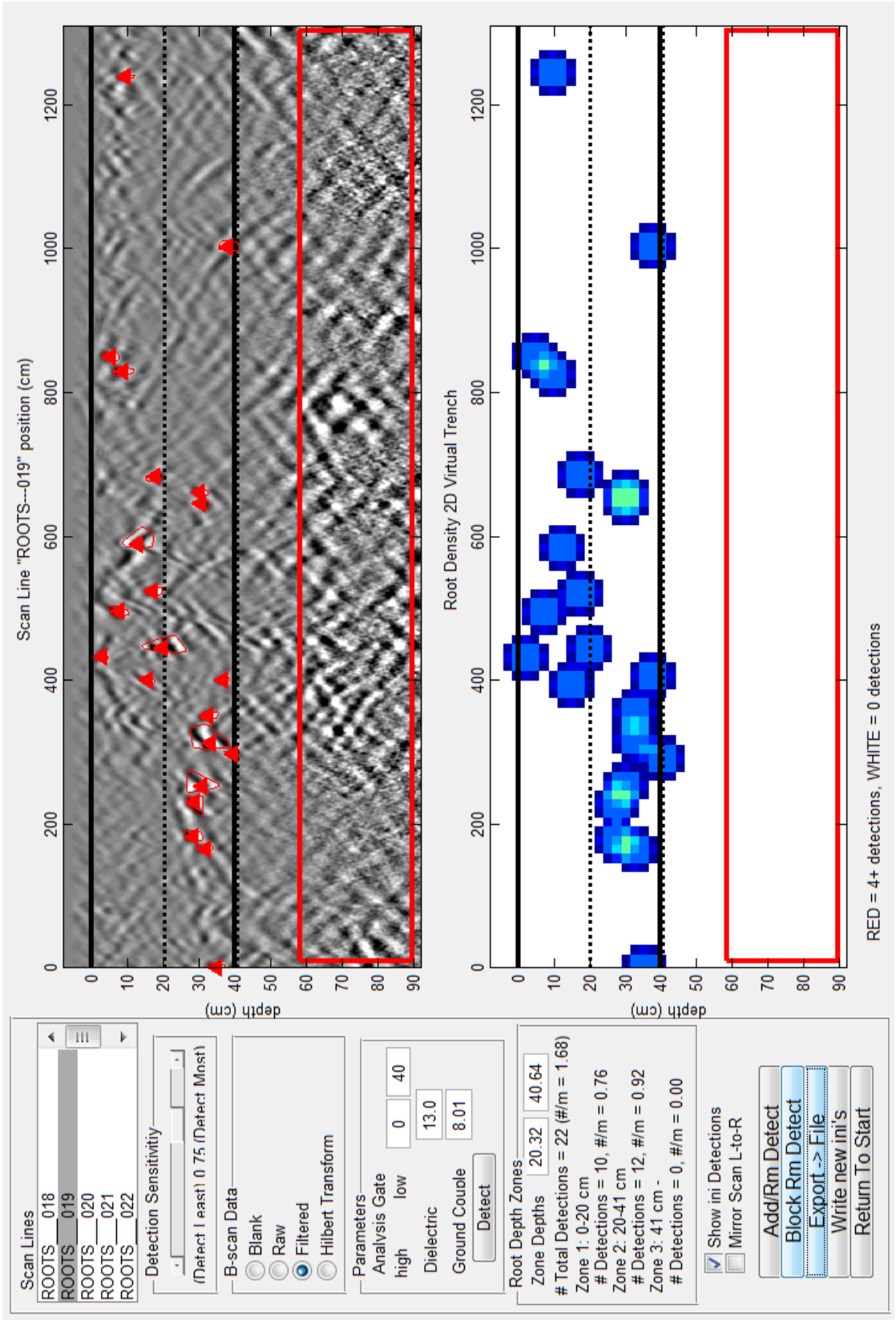

Scan 17
Scan 16
Scan 19
Finish of scans 15,16 &17
Finish of scans 1,3,5,8 &
12

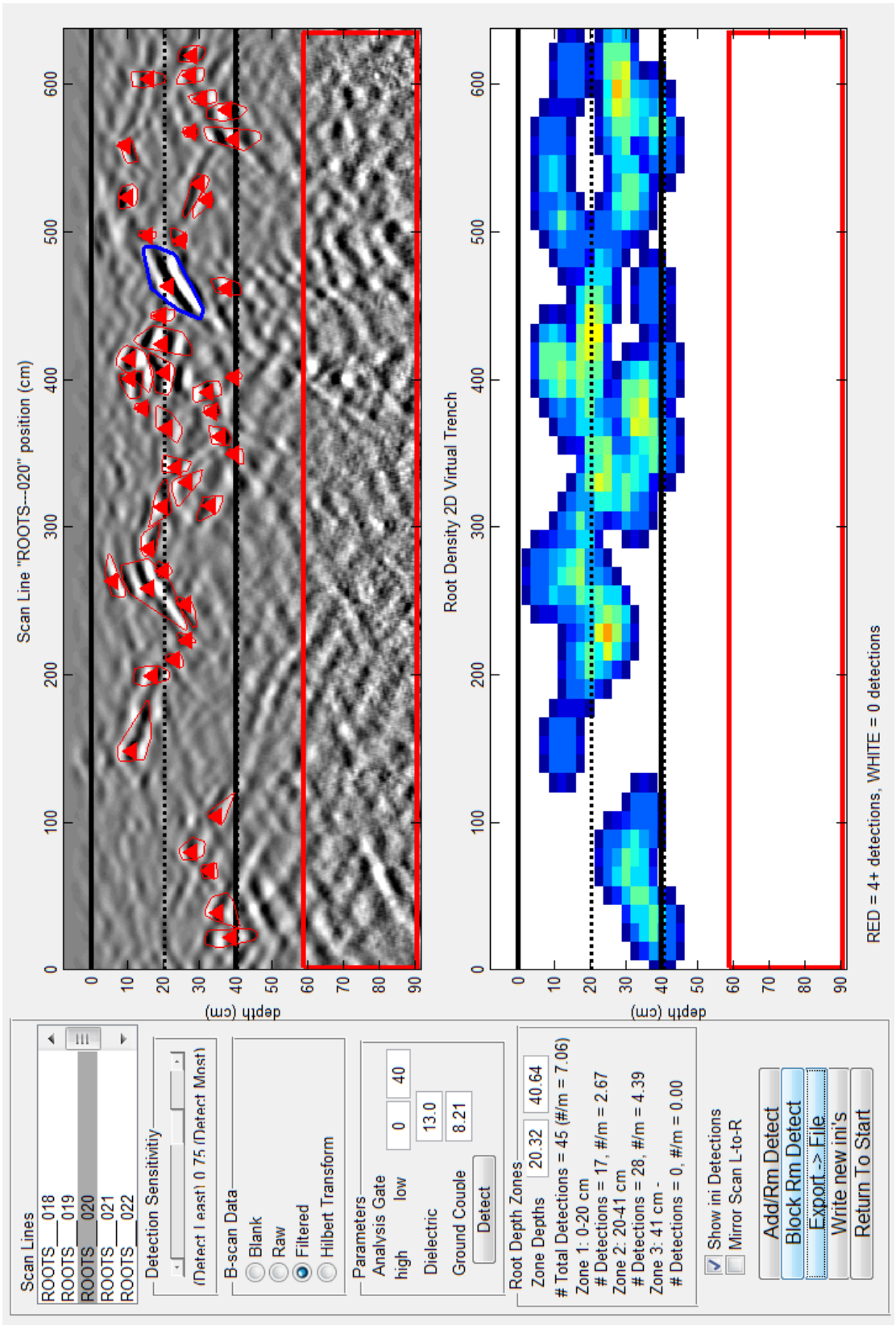

HOUSE
17
16
15
11
8
14
13
2
4
6
9
12
1
3
5
7
10
CASTLE STREET.

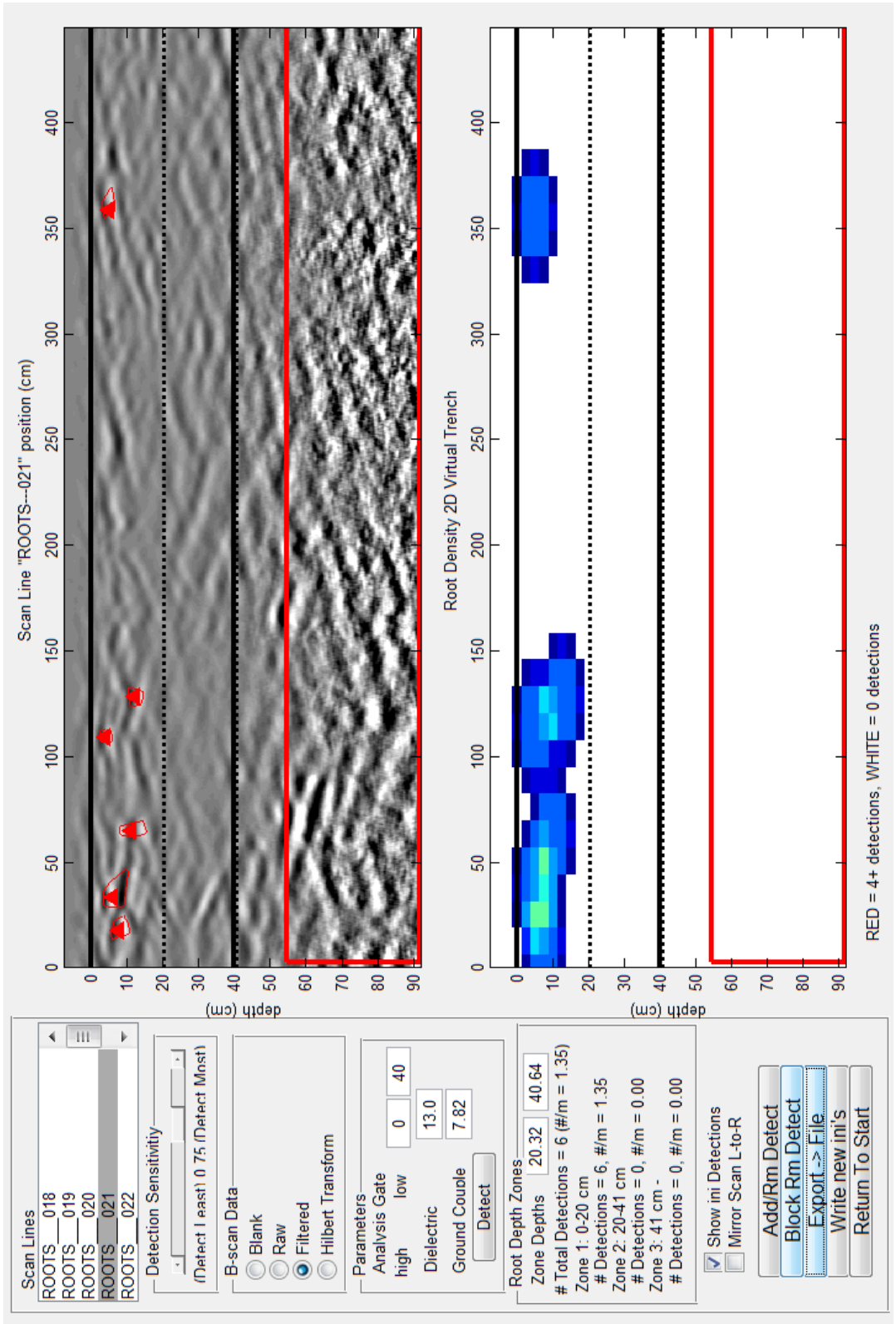
The second Ficus is located at 19 Pine Avenue. Six linear scans were done between the tree and the adjoining property. Scans 22 and 23 may contain some roots of other trees that have previously been removed.

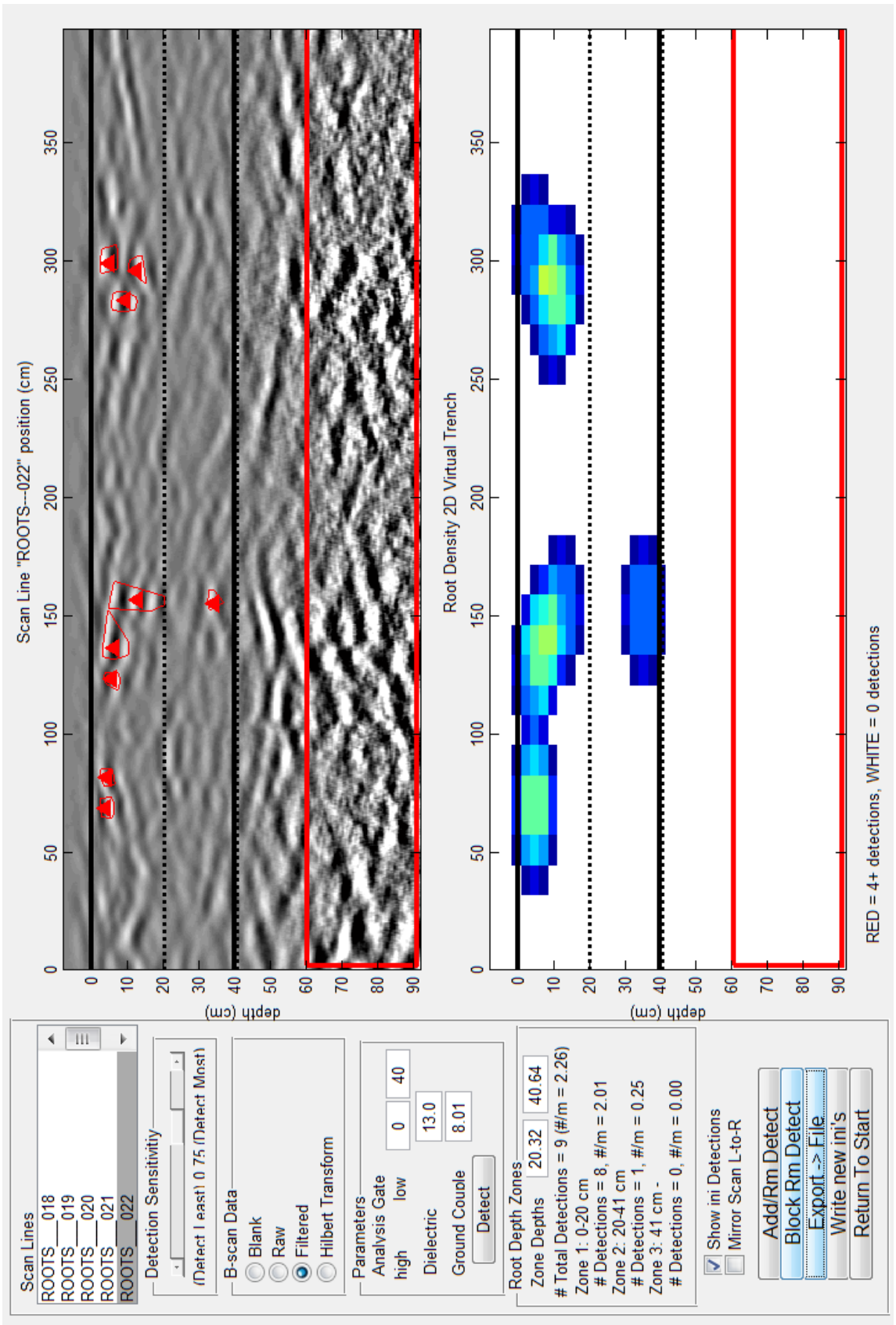
The six scan graphs follow with a site map of the scan line and photographs of the scan areas. There is a proliferation of roots along the first three scan lines closest to the tree. The last three scans show a decline in the amount of roots.

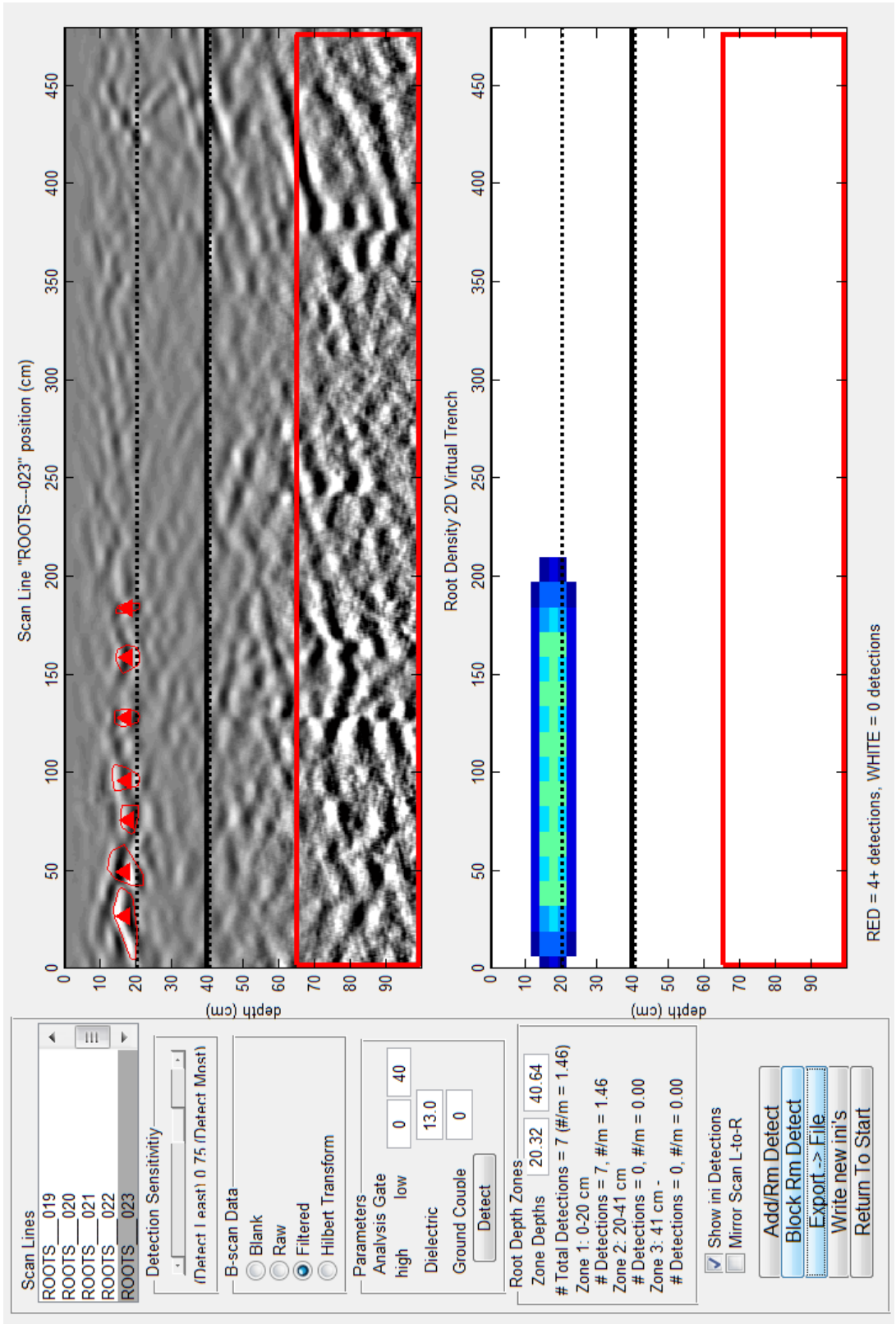

Scan Line "ROOTS--018" position (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__018
ROOTS__019
ROOTS__020
ROOTS__021
ROOTS__022
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
low
high
0
40
Dielectric
13.0
Ground Couple
8.01
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 59 (#/m = 4.45)
Zone 1: 0-20 cm
Detections = 27, #/m = 2.04
Zone 2: 20-41 cm
Detections = 32, #/m = 2.42
Zone 3: 41 cm -
Detections = 0, #/m = 0.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start

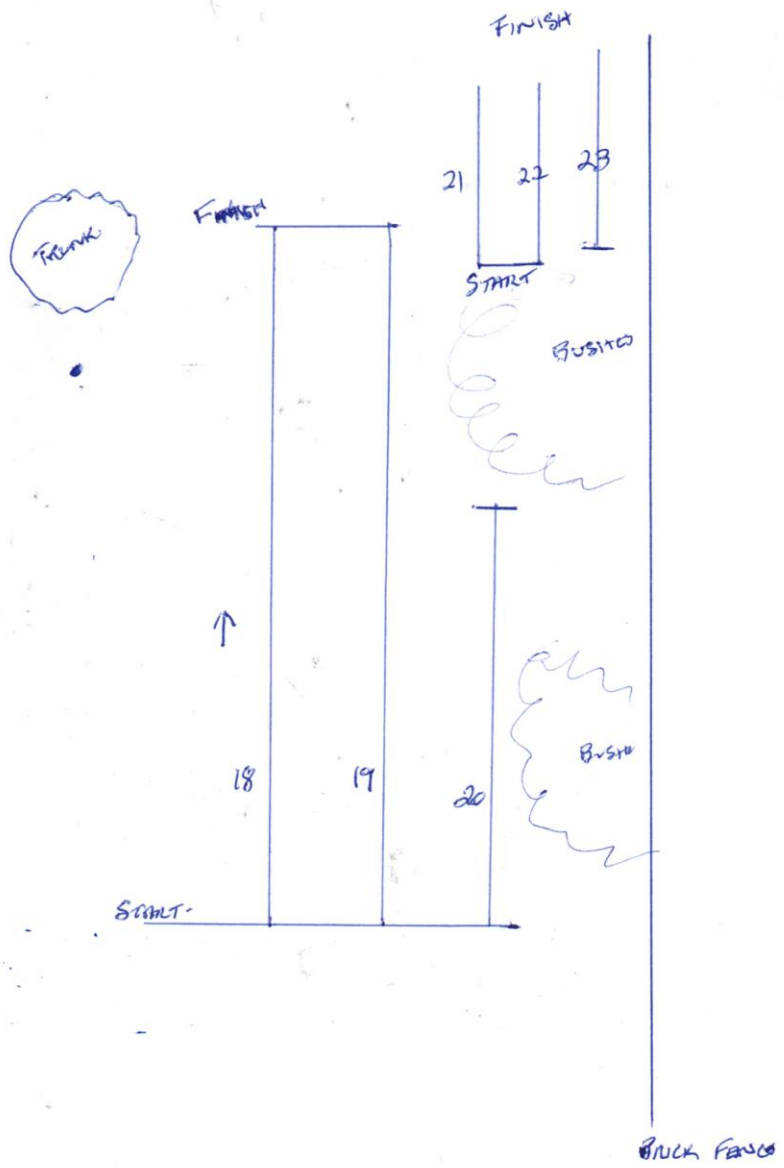

Scan Line "ROOTS---019" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__018
ROOTS__019
ROOTS__020
ROOTS__021
ROOTS__022
Detection Sensitivity
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
40
Dielectric
13.0
Ground Couple
8.01
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 22 (#/m = 1.68)
Zone 1: 0-20 cm
Detections = 10, #/m = 0.76
Zone 2: 20-41 cm
Detections = 12, #/m = 0.92
Zone 3: 41 cm -
Detections = 0, #/m = 0.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start


Scan Line "ROOTS---020" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__018
ROOTS__019
ROOTS__020
ROOTS__021
ROOTS__022
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
40
Dielectric
13.0
Ground Couple
8.21
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 45 (#/m = 7.06)
Zone 1: 0-20 cm
Detections = 17, #/m = 2.67
Zone 2: 20-41 cm
Detections = 28, #/m = 4.39
Zone 3: 41 cm -
Detections = 0, #/m = 0.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start


Scan Line "ROOTS---021" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__018
ROOTS__019
ROOTS__020
ROOTS__021
ROOTS__022
Detection Sensitivity
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
40
Dielectric
13.0
Ground Couple
7.82
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 6 (#/m = 1.35)
Zone 1: 0-20 cm
Detections = 6, #/m = 1.35
Zone 2: 20-41 cm
Detections = 0, #/m = 0.00
Zone 3: 41 cm -
Detections = 0, #/m = 0.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start

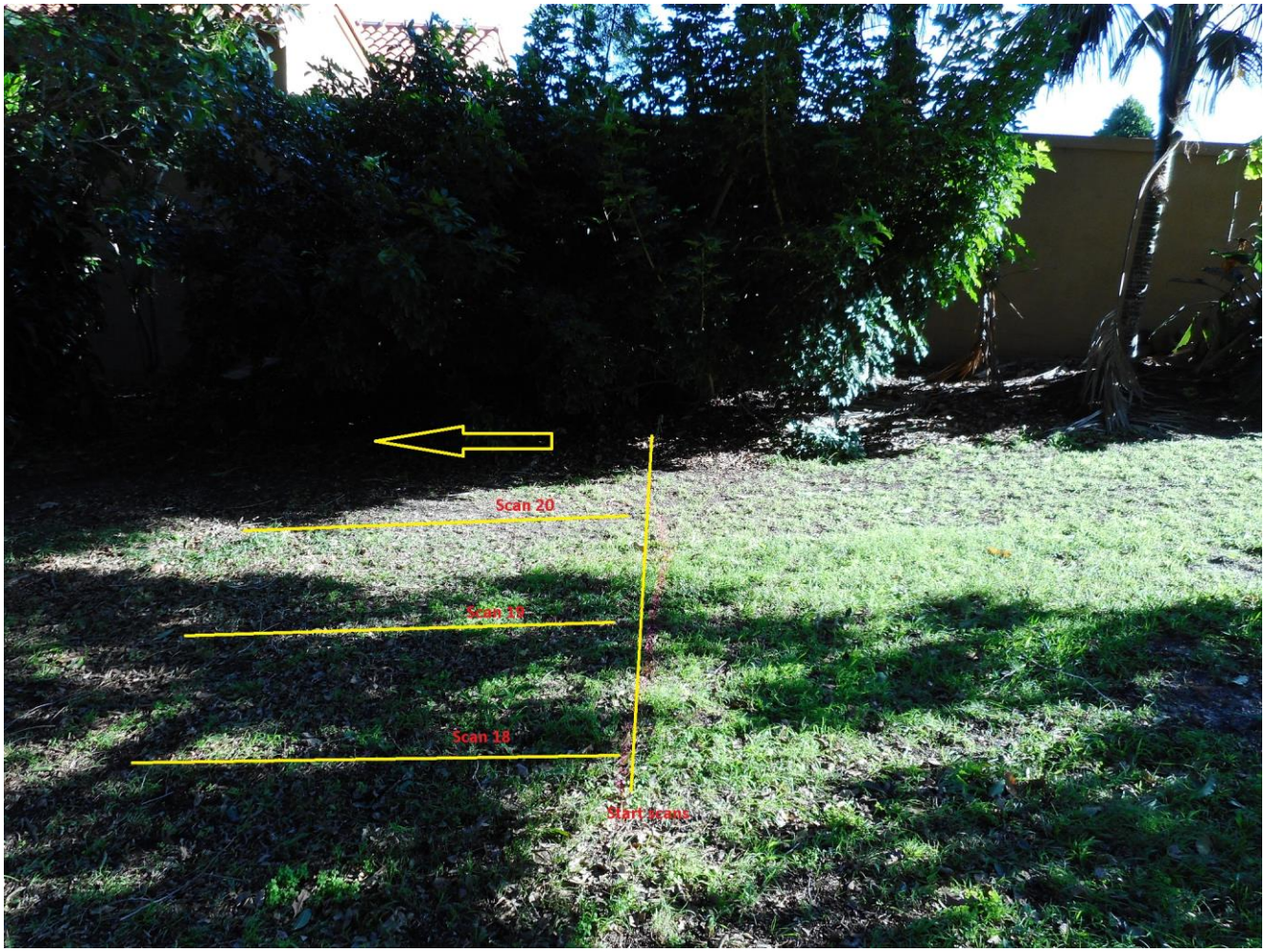

Scan Line "ROOTS---022" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS__018
ROOTS__019
ROOTS__020
ROOTS__021
ROOTS__022
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
40
Dielectric
13.0
Ground Couple
8.01
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 9 (#/m = 2.26)
Zone 1: 0-20 cm
Detections = 8, #/m = 2.01
Zone 2: 20-41 cm
Detections = 1, #/m = 0.25
Zone 3: 41 cm -
Detections = 0, #/m = 0.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start


Scan Line "ROOTS---023" position (cm)
depth (cm)
Root Density 2D Virtual Trench
depth (cm)
RED = 4+ detections, WHITE = 0 detections
Scan Lines
ROOTS___019
ROOTS___020
ROOTS___021
ROOTS___022
ROOTS___023
Detection Sensitivity
(Detect Least) 0.75 (Detect Most)
B-scan Data
Blank
Raw
Filtered
Hilbert Transform
Parameters
Analysis Gate
high
low
0
40
Dielectric
13.0
Ground Couple
0
Detect
Root Depth Zones
Zone Depths
20.32
40.64
Total Detections = 7 (#/m = 1.46)
Zone 1: 0-20 cm
Detections = 7, #/m = 1.46
Zone 2: 20-41 cm
Detections = 0, #/m = 0.00
Zone 3: 41 cm -
Detections = 0, #/m = 0.00
Show ini Detections
Mirror Scan L-to-R
Add/Rm Detect
Block Rm Detect
Export -> File
Write new ini's
Return To Start


FINISH
21
22
23
START
BUSH
18
19
20
BUSH
START
BRICK FENCE
PINE AVE


Finish of scans 18&19
Finish scan 20

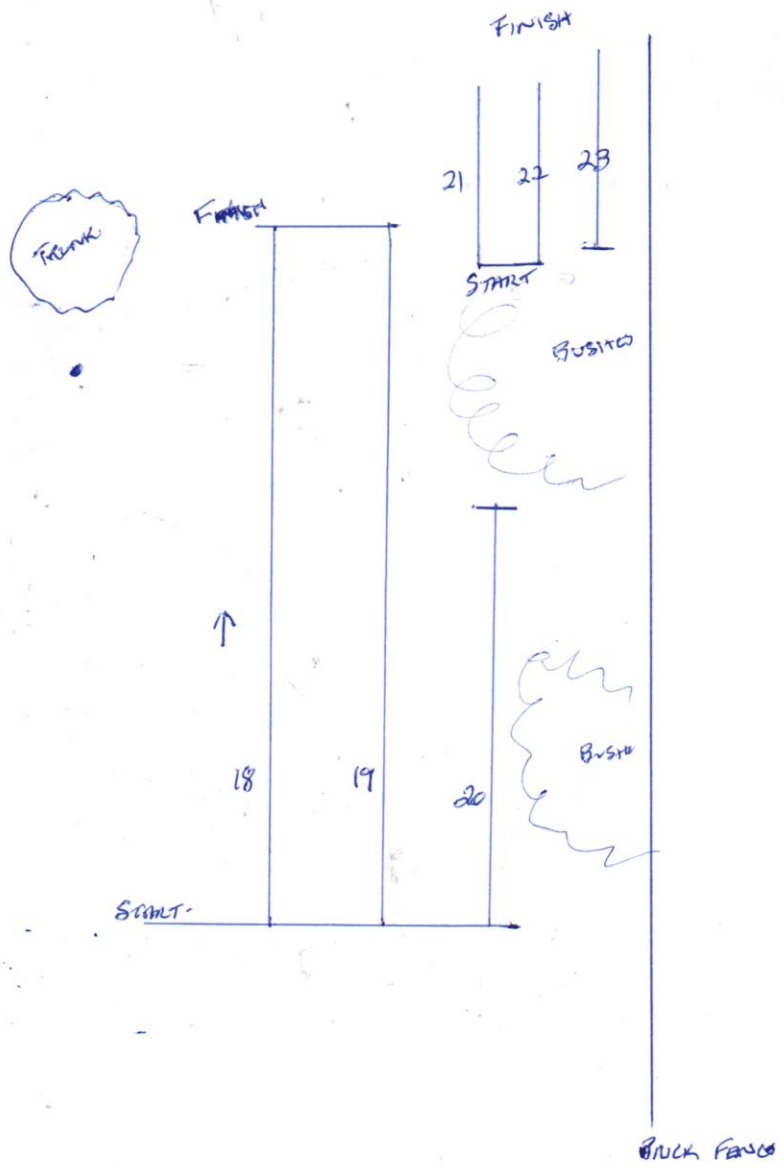

SCAN 20
SCAN 18
Start
sCAN 19



Ballina Shire Council. Lennox Head scans

Ballina Shire Council. Lennox Head scans

Ballina Shire Council. Lennox Head scans


FINISH
21
22
23
START
BUSH
18
19
20
BUSH
START
BRICK FENCE
PINE AVE