Views from the Top:
An Expedition to the Redwood Canopy

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URBAN FOREST INNOVATIONS INC.

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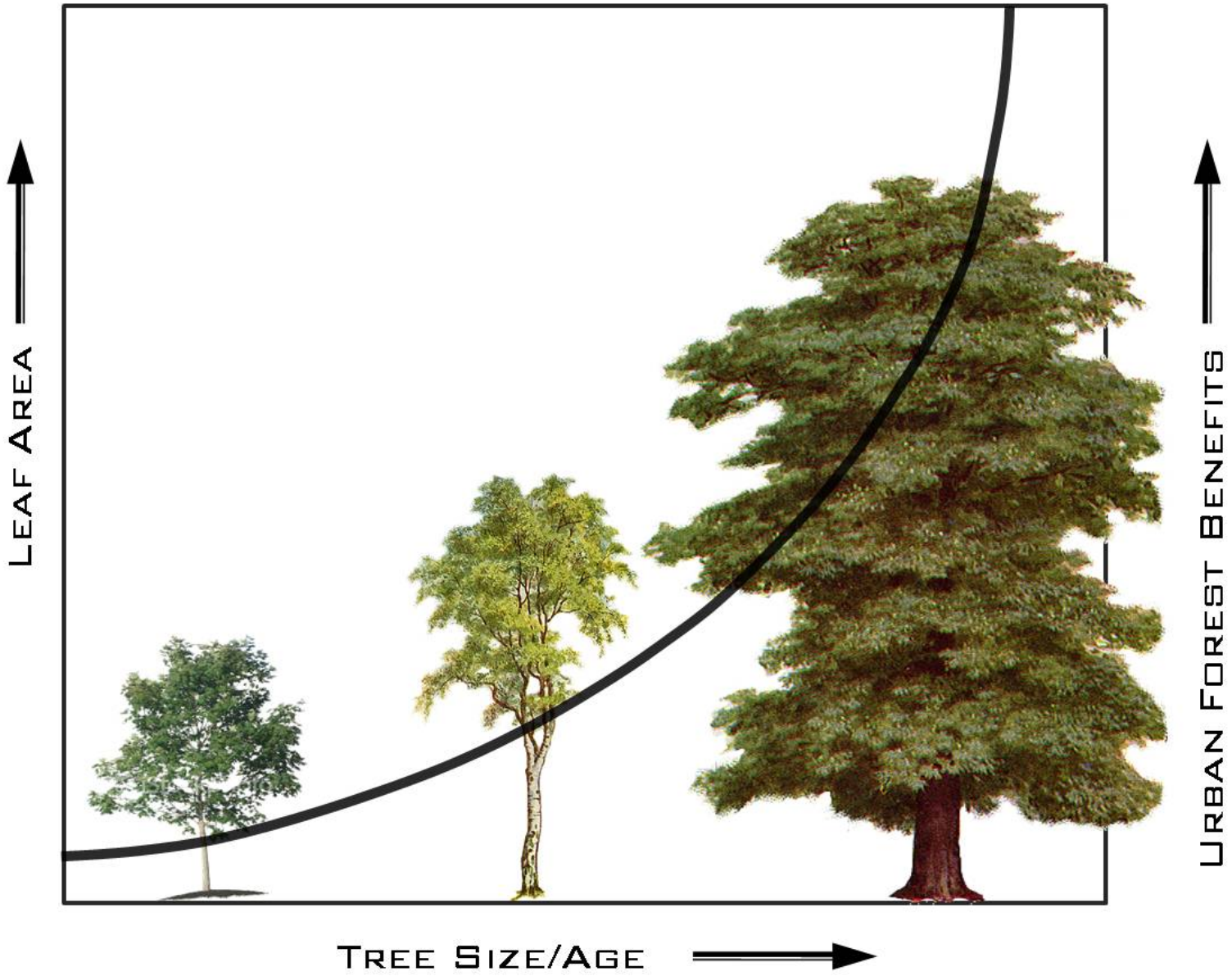
URBAN FOREST INNOVATIONS INC

Benefits of Trees

Trees in human landscapes provide a wide range of services:

- Improved air quality
- Micro-climate effects (e.g. shading)
- Property value & aesthetics
- Storm-water attenuation
- Energy conservation
- Noise reduction
- **Wildlife habitat**
- Physical & psychological wellbeing
- etc.

Maximizing Leaf Area



Veteran Trees: Habitat and History

Old trees are important habitat for *saproxylic* beetles and other organisms.

→ *living on dead wood*

Jonsell (2004) found that old oaks and lindens (up to 300+ years) in Swedish parks have comparable 'red-listed' beetle diversity as old remnant natural areas.

By conserving old trees in cultural landscapes, we can protect history and habitat at the same time.

Old Trees: Habitat and History

Veteran Tree: Hazard and Habitat

VETERAN TREES
INITIATIVE
WORKSHOP

HAZARD

1 MAJOR DEADWOOD
Subject to failure

2 UPPER CROWN LIMB - SMALL CAVITIES
May lead to breakage

3 CROWN LIMB - LARGE CAVITY
May lead to breakage

4 FUNGAL GROWTH ON LIMB
Potential limb failure

5 SNAG / LIVE STUB
Decay entry site may lead to breakage

6 BARK WITH FUNGAL INFECTION
Fungal cankers may lead to breakage

7 SUSPENDED BROKEN LIMB
High likelihood of failure

8 WEAK FORK WITH INCLUDED BARK
Inherent defect may lead to crown failure

9 WATER FILLED ROT HOLE
Concealed decay could lead to breakage

10 FLUX ON BARK
May indicate limb defect leading to breakage

11 SCAR TISSUE FROM OLD WOUND
Decay site may lead to trunk failure

12 BRACKET FUNGI
Heartwood decay may weaken trunk

13 DELAMINATION OF WOOD
Can lead to breakage

14 SUBSIDING MAJOR LIMB
Can lead to breakage

15 FALLEN LIMB
Pedestrian hazard

16 LIGHTNING STRIKE
Weakened wood, decay entry at wound site

17 FUNGAL COLONISATION OF ROOT
May lead to root failure

18 BASAL CAVITY
Potential failure point

19 ROT HOLE IN TRUNK
May lead to trunk failure

20 ROOT DAMAGE FROM BROWSING
Decay may lead to root failure

By Neville Fay of Treework Environmental Consultancy.

Old trees characteristically contain many wounds. These may lead to the eventual failure of crown limbs or even the trunk itself. An assessment of hazard needs to take into consideration the proximity of the tree to nearby structures, the intensity of public use of the area around the tree and the likelihood of failure. These 'faults' are the very same features which also provide such a wide range of important habitat. When considering the management of veteran trees, both of these aspects need to be taken into consideration and expert advice should be sought.

HABITAT

1 MAJOR DEADWOOD
Sunbaked, aerial deadwood, desiccated wood (longhorn beetles)

2 UPPER CROWN LIMB - SMALL CAVITIES
Dry rot holes - birds, bat roost indicated by urine stain (hornets nests)

3 CROWN LIMB - LARGE CAVITY
'Brown' rot (stiletto flies, cardinal click beetle, darkling beetles, Barn Owl roosts)

4 FUNGAL GROWTH ON LIMB
Fungi on bark (wood awl flies, false ladybirds)

5 SNAG / STUB
Large surface area for egg laying and fungi (cardinal beetle)

6 BARK WITH FUNGAL INFECTION
Fungi on bark (cardinal beetles, wood awl flies, false ladybirds)

7 SUSPENDED BROKEN LIMB
Shattered end provides large surface area for egg laying and fungi

8 WEAK FORK WITH INCLUDED BARK
Nest (birds, squirrels, rove beetles, micromoths)

9 WATER FILLED ROT HOLE
Water filled rot hole (hover flies, water beetles)

10 FLUX ON BARK
Established sap run (sap beetles, hover flies and fungus gnats)

11 SCAR TISSUE FROM OLD WOUND
Damaged loose bark (bark beetles, false scorpions and spiders)

12 BRACKET FUNGI
Heart rot prepares wood for invertebrates, (fungus gnats, shining fungus beetles)

13 DELAMINATION OF WOOD
Fungi / invertebrates (cardinal beetle, sap beetle)

14 SUBSIDING MAJOR LIMB
May lead to shattered stub habitat

15 FALLEN LIMB
Fallen timber habitat: leave in partial shade

16 LIGHTNING STRIKE
Burnt wood (flat bugs, false weevil, smoke flies)

17 FUNGAL COLONISATION OF ROOT
Damaged loose bark: (bark beetles, false scorpions and spiders)

18 BASAL CAVITY
Hollowing trunk (cardinal beetles, lesser stag beetle, crane flies)

19 ROT HOLE IN TRUNK
Soft rot (lesser stag beetle, rhinoceros beetle, combhorn crane flies)

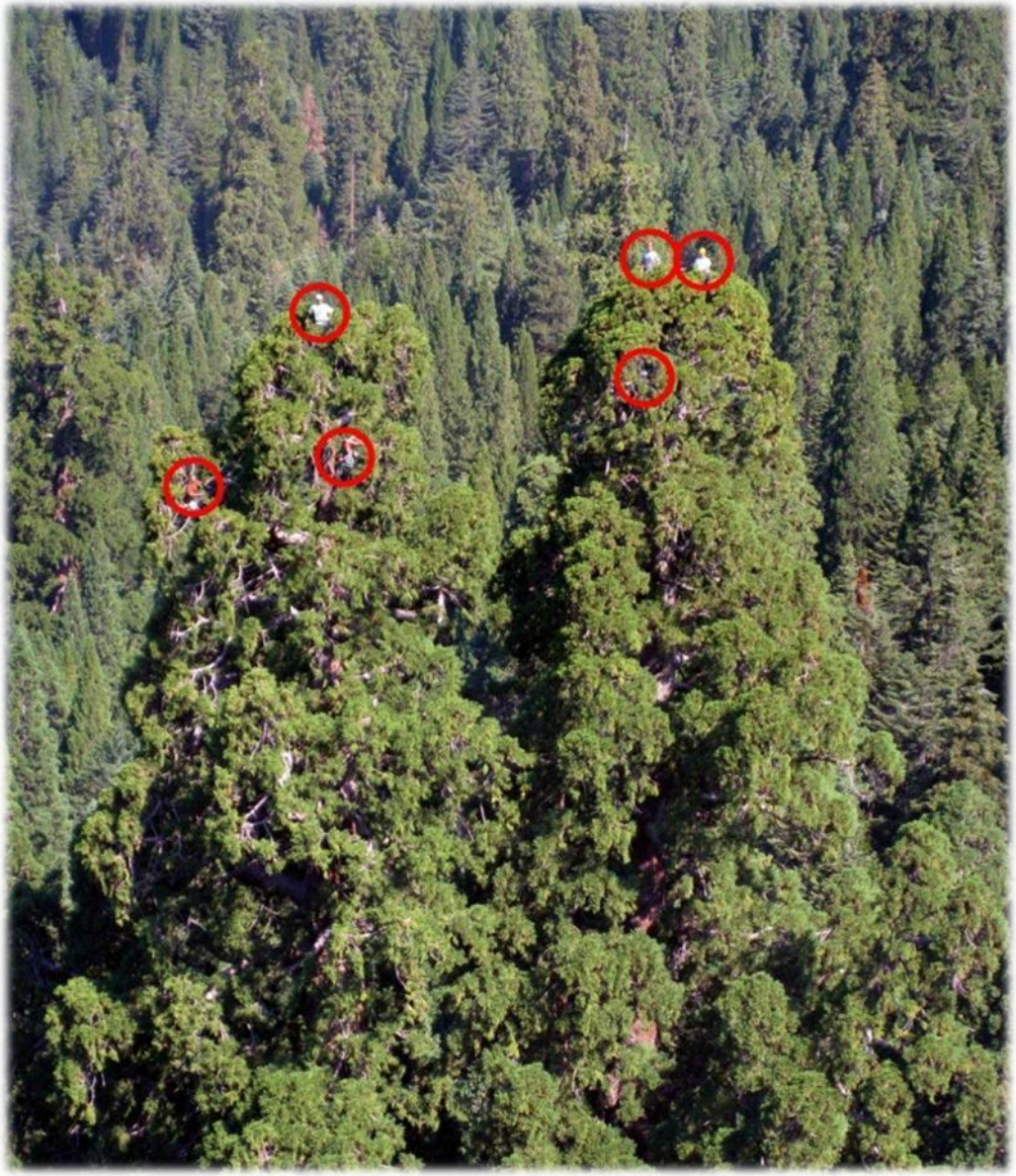
20 ROOT DAMAGE FROM BROWSING
Soft rot (stag beetle, hover flies, combhorn crane flies)

Neville Fay

Giant Redwoods – *California, USA*

November 2008

Redwood Rainforest



Coast Redwoods

- 115 trees/ha
- 12 trees have 95% of the biodiversity
- These are the old trees with broken tops, etc.

Sillett and Van Pelt 2000.
'A Redwood Tree Whose Crown May Be the Most Complex on Earth'

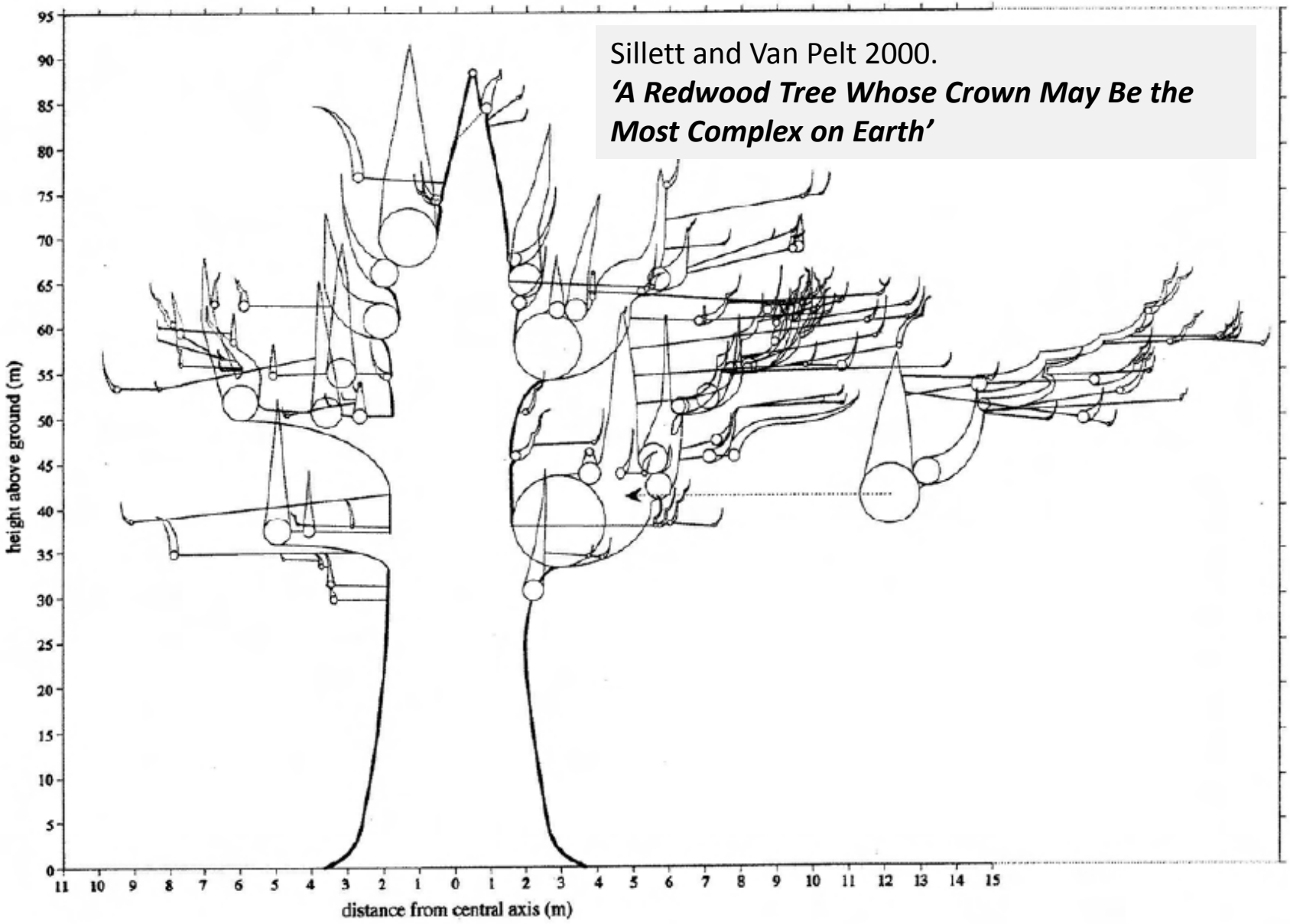
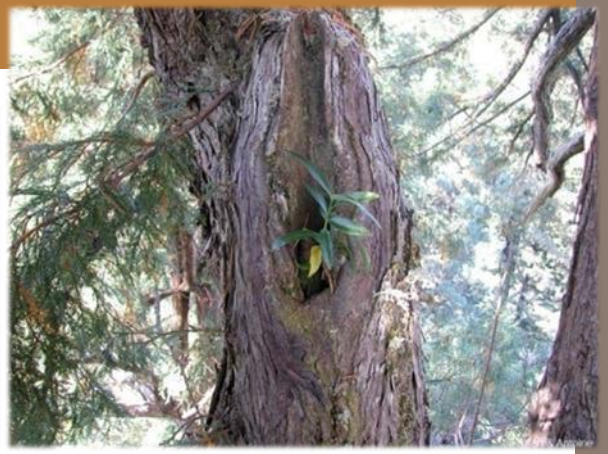
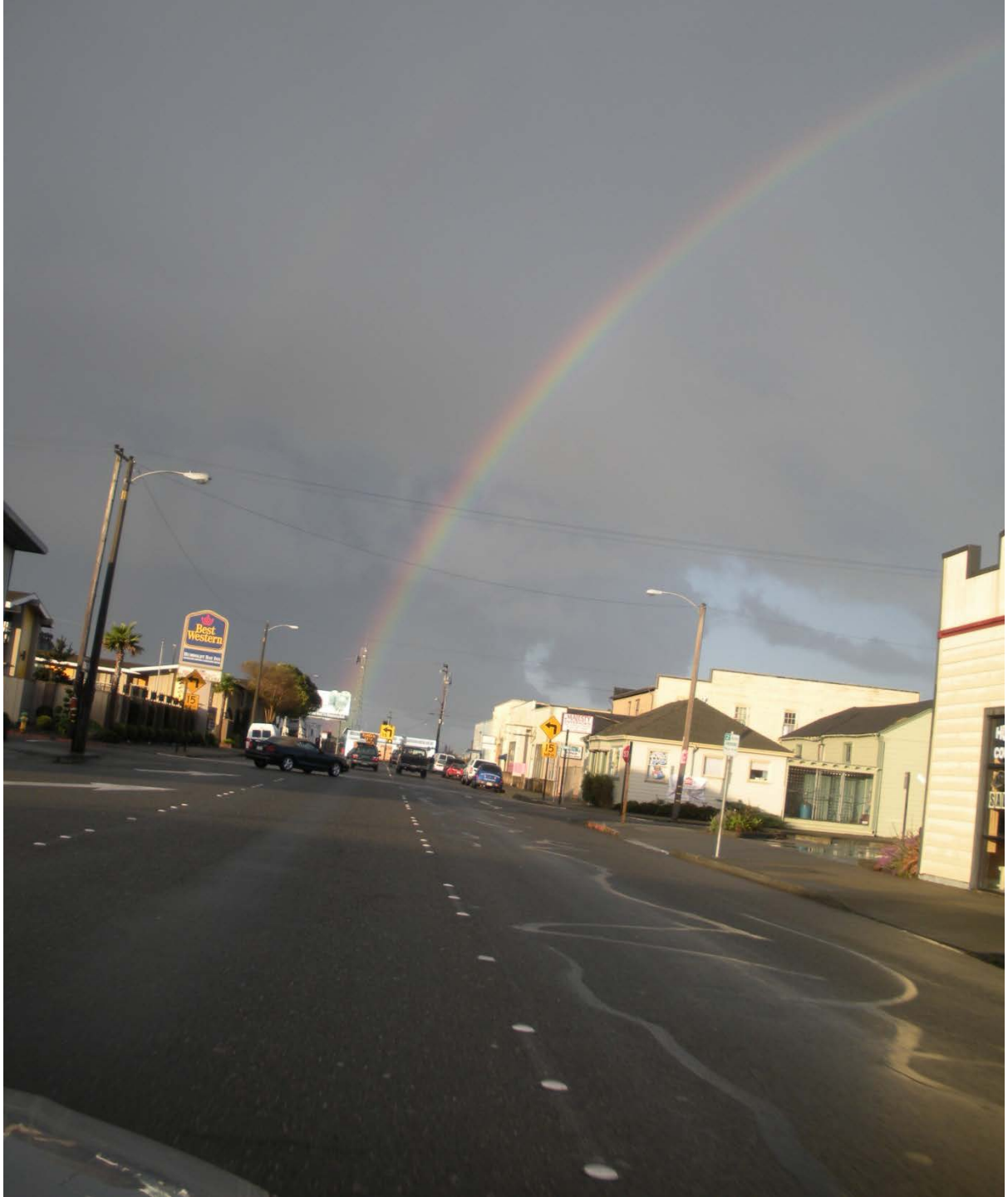


Figure 4. *Crown diagram of Iluvatar. All trunk diameters are drawn to the scale of the x-axis, which is expanded relative to the scale of the y-axis. Circles correspond to the basal diameters of reiterated trunks. Circles with serrated edges indicate broken trunks. Gray lines indicate dead trunk. Branches bearing reiterated trunks are depicted with single straight lines. No other branches are shown. The arrow with a dotted line indicates the origin of a reiterated complex that was graphically displaced to the right for clarity.*

Ancient Redwoods




Best Western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Metolius


14
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35
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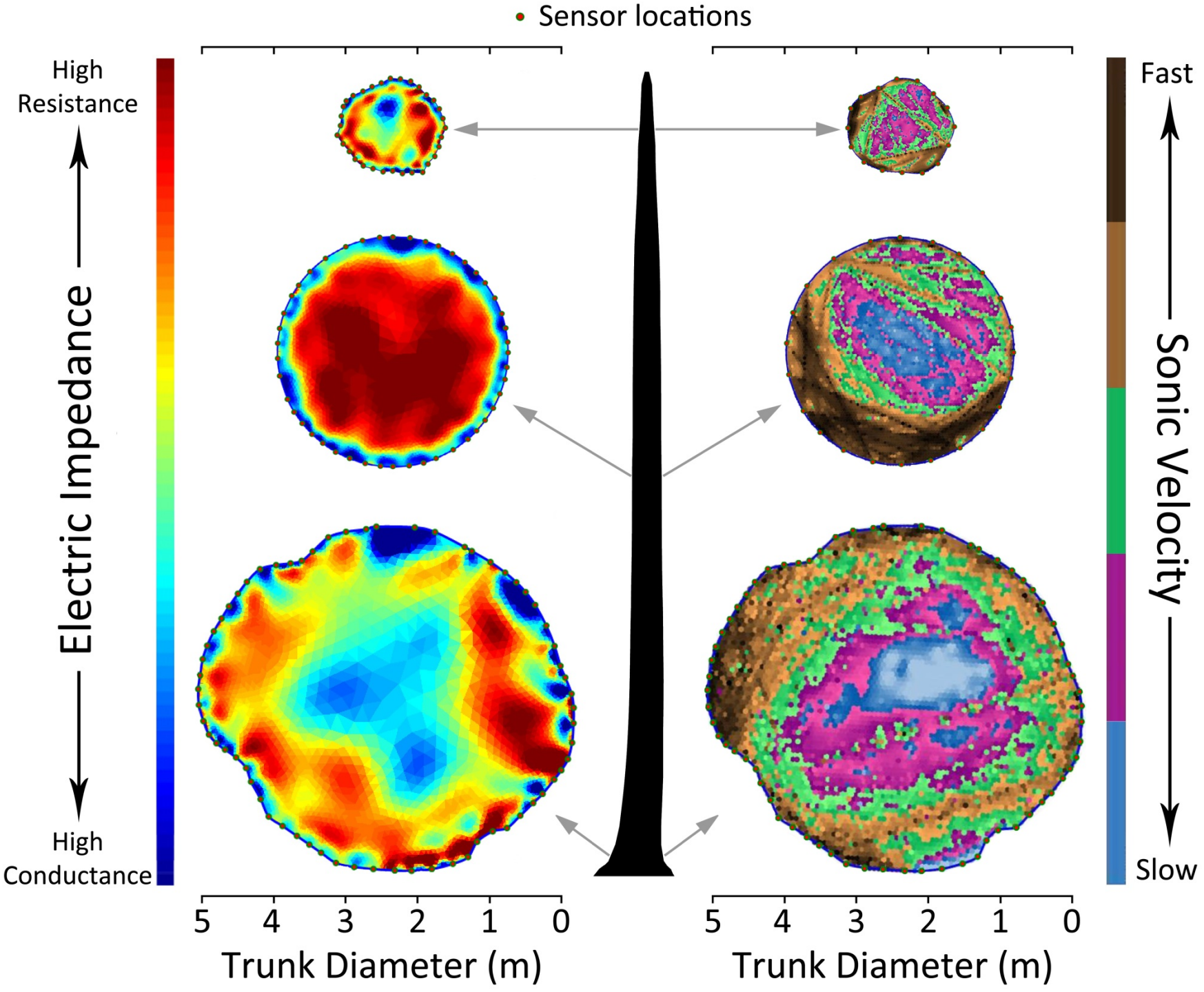
Adr 72
PICUS


Black Diamond


Sensor locations
High Resistance
Electric Impedance
High Conductance
Fast
Sonic Velocity
Slow
5 4 3 2 1 0
Trunk Diameter (m)
5 4 3 2 1 0
Trunk Diameter (m)

QUESTIONS? COMMENTS?

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