Avoiding Environmental Collapse:
Pre-European Cultural Response to Deforestation
On Pacific Islands

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Degrees of Deforestation
Scale: 1 - 5

5: Almost completely deforested

Easter Island
4: Largely deforested
Forests mainly on coastal plain, valley floors, and very steep slopes
3: Densely Forested:

Primary forest at high elevations;
secondary forest at low elevations;
extensive grass/fern savannas on ridges, slopes, plateaus
2: Densely Forested:

Primary forest at high elevations;
secondary forest at low elevations;
no grass/fern savannas
1: No Deforestation
Degrees of forest replacement

Scale: 1 - 5

1: Introduced tree species less than 10% of all trees

4: Introduced tree species 50-75% of all trees up to 600 meters; less than 10% above 600 meters

Marquesas

New Zealand
Predictors of Deforestation?

Rainfall

Elevation

Latitude
Predictors of Deforestation?

Island age

Volcanic ash
Predictors of Deforestation?

Makatea
Predictors of Deforestation?

Area
Isolation
Tree Model: Deforestation

Number of terminal nodes: 8
Residual mean deviance: 0.8702 = 56.57 / 65
Misclassification error rate: 0.1842 = 14 / 76
Replacement

Number of terminal nodes: 6
Residual mean deviance: 0.5818 = 39.56 / 68
Misclassification error rate: 0.1184 = 9 / 76