TOWARDS COST-EFFECTIVE INDICATORS TO MAINTAIN NATURA 2000 SITES IN FAVOURABLE CONSERVATION STATUS.

A CASE STUDY FROM CANSIGLIO (IT) AND THE NEW FOREST (UK)

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Introduction

Natura 2000 is a coherent ecological network of special areas, designated under the Habitat and Birds EEC Directives, to assist in the maintenance of biodiversity in the European territory. It is now widely recognised that one of the most effective ways to maintain biodiversity is to preserve habitats in a favourable conservation status as required of Member States by the Habitat Directive. As a consequence, approaches are needed to define when habitats are of favourable conservation status and to assess the maintenance or the restoration of this condition. This could be partly achieved through the selection of appropriate indicators of favourable conservation status. This research aims to answer the following questions for two selected Natura 2000 sites –The Cansiglio Forest (Northern Italy) and The New Forest (Southern England).

Research questions

I. What criteria & indicators should be used to assess the conservation status of forested habitats at the local scale ?

II. Which of these indicators can be collected in a cost-effective way?

III. Can practical guidelines be developed to evaluate the conservation status of forested habitats?

Methods

Two sampling methods have been compared to date: (i) a 50 m x 50 m survey plot, (ii) a point transect method. Time to collected data was recorded. Indicators were selected from a comprehensive literature review. 20 indicators were selected for survey, focusing on forest structure, woody and herbal layer composition, and deadwood. Sampling units were defined according the units currently used in management planning and monitoring.

Fig.1: Sampling units in the Cansiglio Forest [original data provided by Del Favero et al. (2000); reproduced with permission].
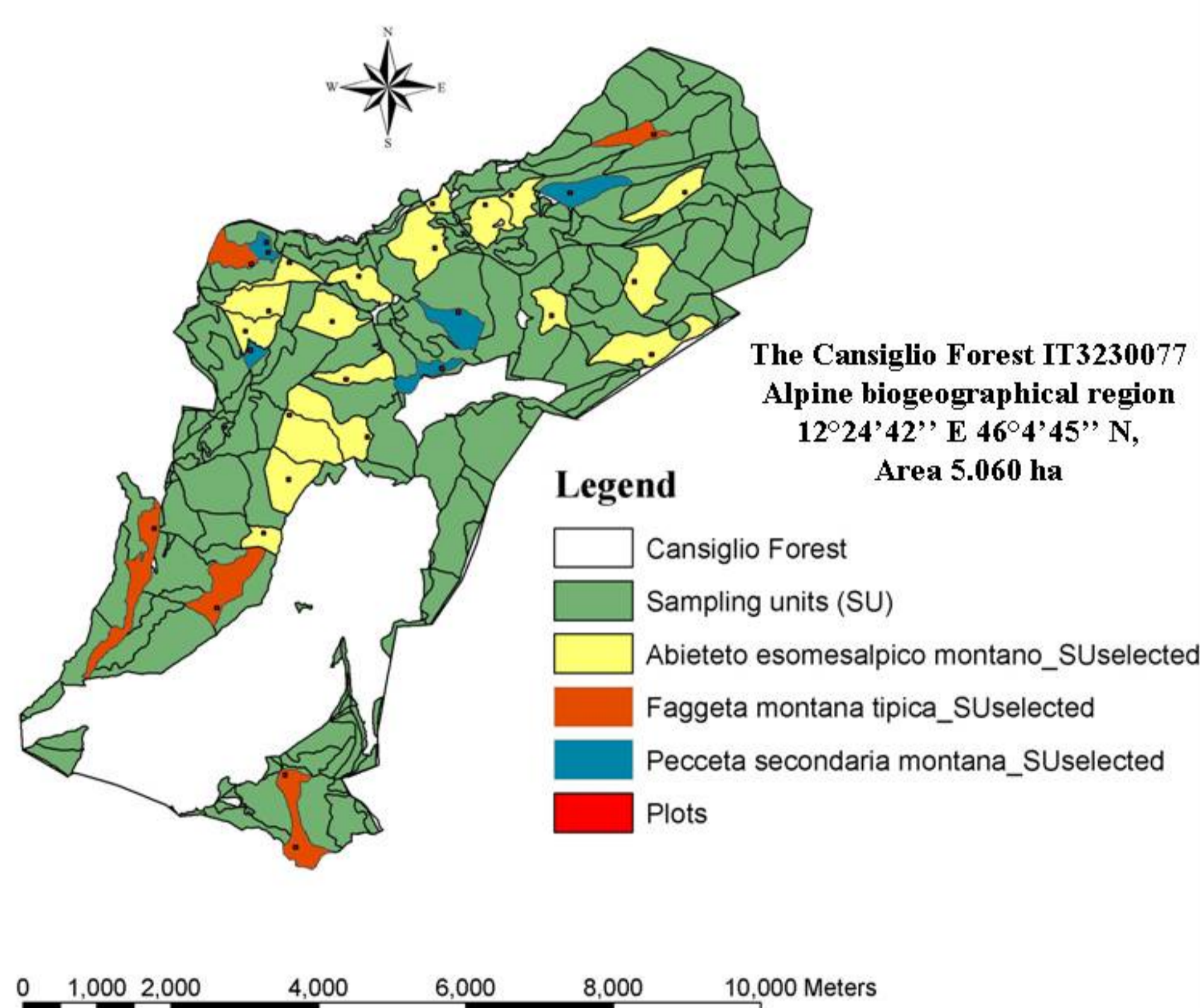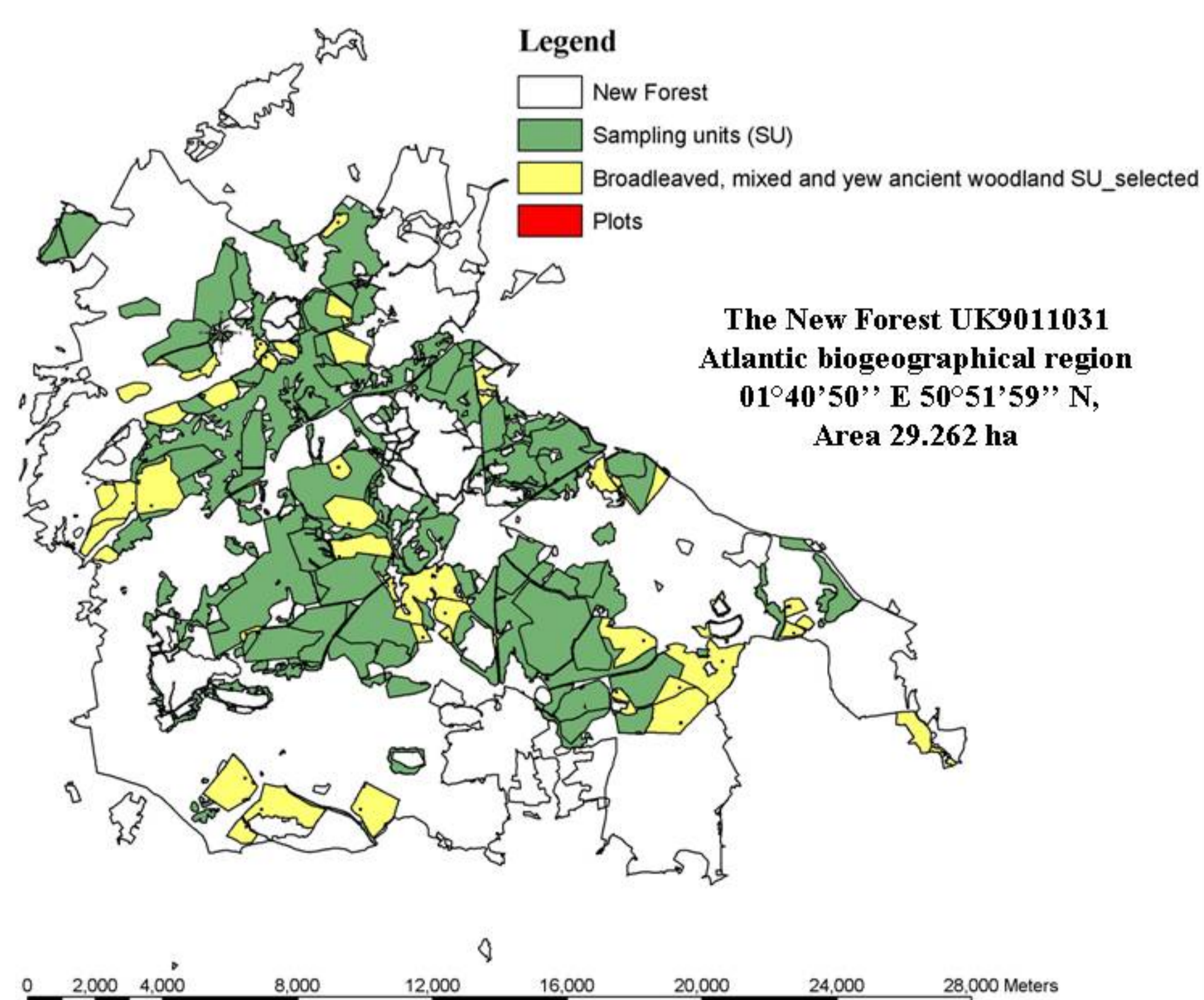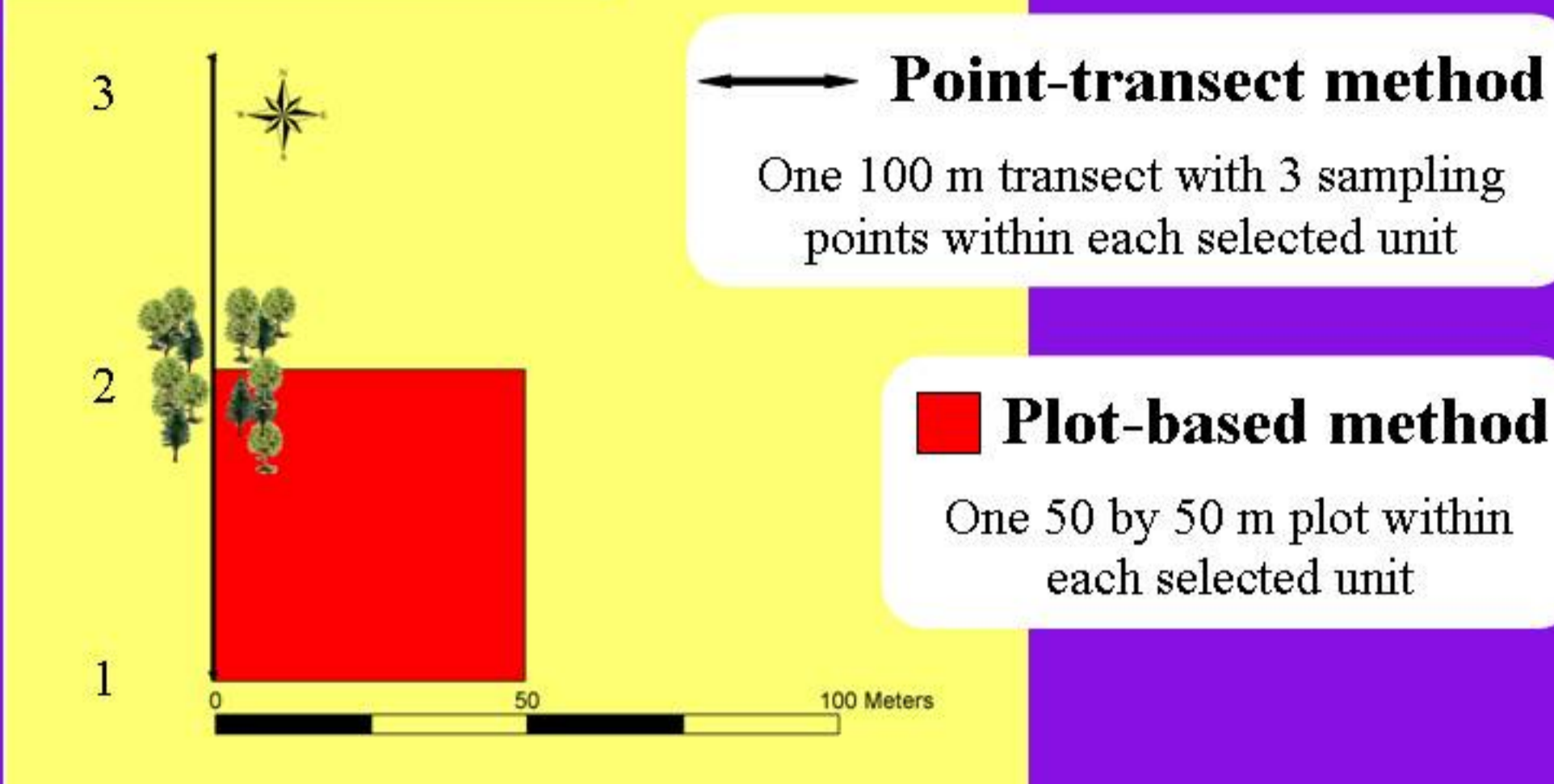
The Cansiglio Forest IT3230077
Alpine biogeographical region
12°24'42'' E 46°4'45'' N,
Area 5.060 ha

Legend
- Cansiglio Forest
- Sampling units (SU)
- Abieteto esomesalpico montano_SUselected
- Faggeta montana tipica_SUselected
- Pecceta secondaria montana_SUselected
- Plots

0 1,000 2,000 4,000 6,000 8,000 10,000 Meters

Fig.2: Sampling units in the New Forest [original data provided by English Nature © 1998 – 2005 English Nature; reproduced with permission].

Legend
- New Forest
- Sampling units (SU)
- Broadleaved, mixed and yew ancient woodland SU_selected
- Plots

The New Forest UK9011031
Atlantic biogeographical region
01°40'50'' E 50°51'59'' N,
Area 29.262 ha

0 2,000 4,000 8,000 12,000 16,000 20,000 24,000 28,000 Meters

Sampling design

→ Point-transect method
One 100 m transect with 3 sampling points within each selected unit

■ Plot-based method
One 50 by 50 m plot within each selected unit

Statistical analyses

To assess cost-effectiveness a paired-t test was performed comparing time spent collecting data for the indicators using the two methods.

Another paired-t test was performed to find out if the estimates of number of trees per hectare and the basal area per hectare were the same using the plot-based and the point-transect methods.

A correlation analysis was performed to examine relationships between indicators.

Results
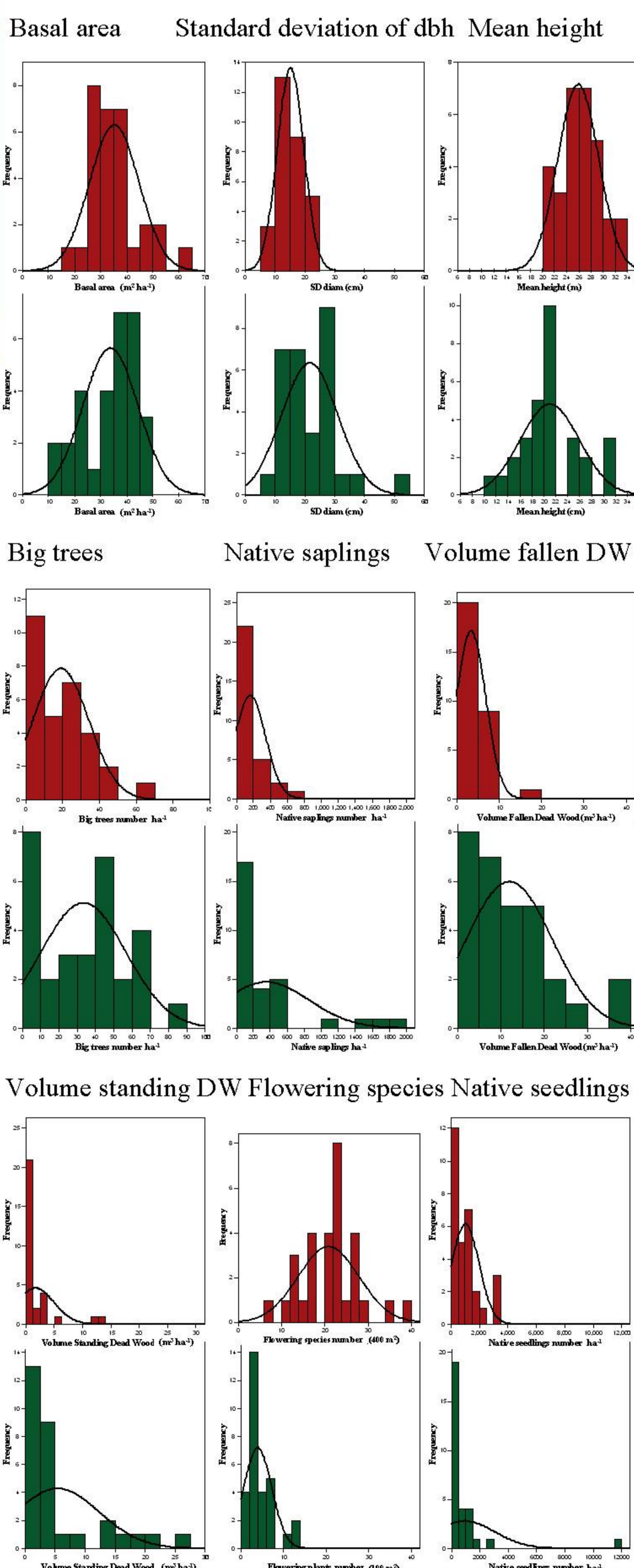
■ Cansiglio Forest   ■ New Forest

Fig. 3: Cansiglio Forest survey unit.

Fig. 4: New Forest survey unit.

Conclusions

Considering a core set of well-known indicators for biodiversity, the plot-based method was found to be less efficient in terms of time taken to collect the data than the transect method ($P<0.001$).

When only structural diversity indicators were considered, then there was no significant difference in the time taken between the two methods ($P>0.05$). No difference in the number of stems and basal area were found using the two different methods ($P>0.05$).

Correlation analysis between indicators showed basal area and indicators related to dead wood volume and decomposition to have the highest number of significant correlations with other indicators.

These results suggest that surveying a subset of indicators using point-transect methods may provide the most efficient way of assessing the conservation status of forested habitats. Alternative survey methods will be examined in future research, together with a critical assessment of the effectiveness of different indicators in evaluating favourable conservation status.

Acknowledgments

For further information

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