

Naturalness assessment

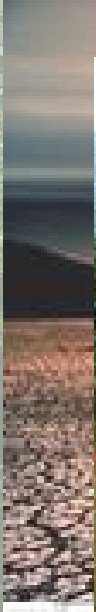
on the basis of plant species and
vegetation indicators

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Naturalness: a relative concept



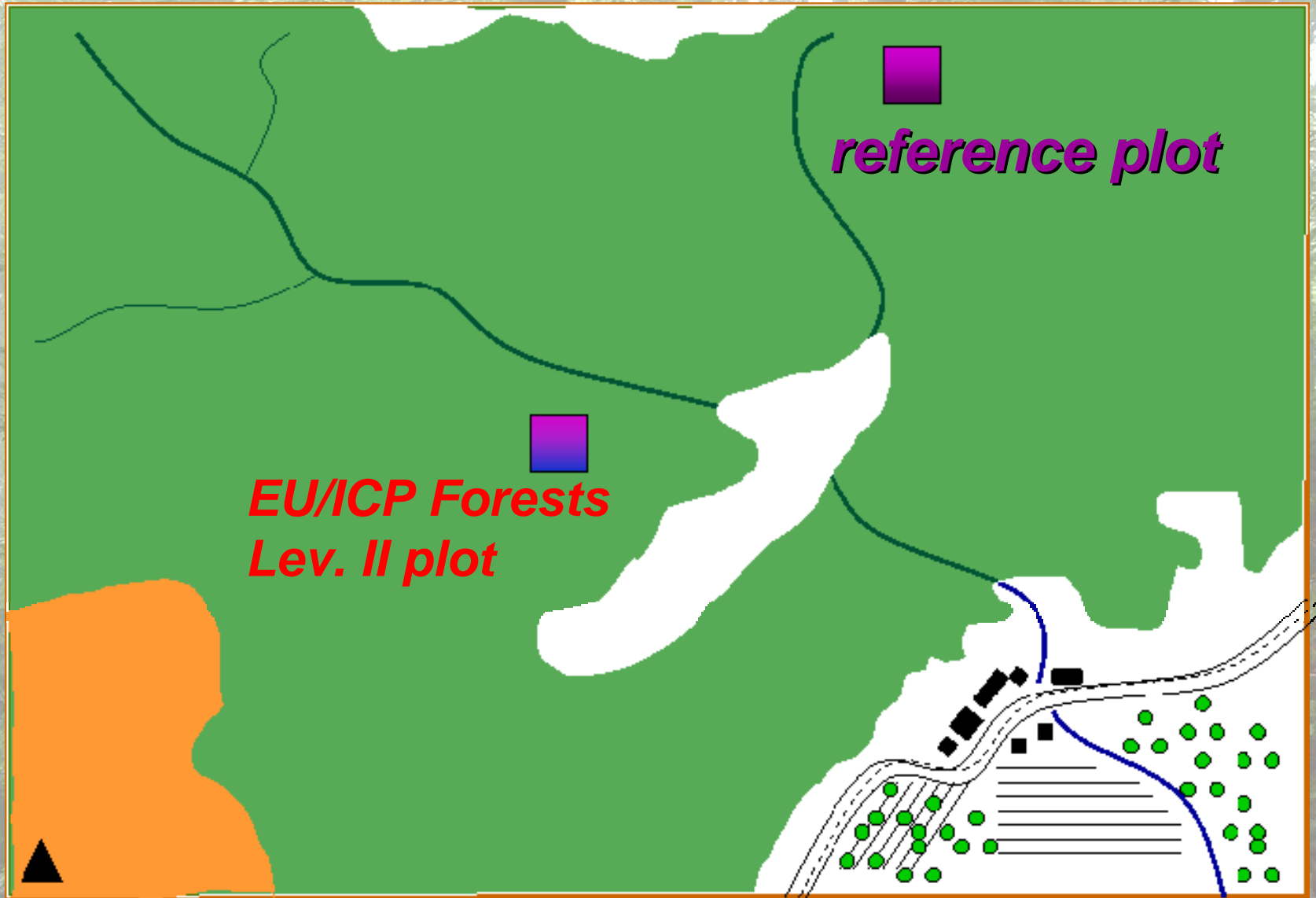
Reference forest stand:

best available less disturbed stand in the area, unmanaged since as long time is possible

(synchronic approach)

- Plantations of not-native species: minimum value
- Old-growth forests: maximum value

Naturalness level as distance between current level and maximum potential level



Naturalness:

a possible definition...

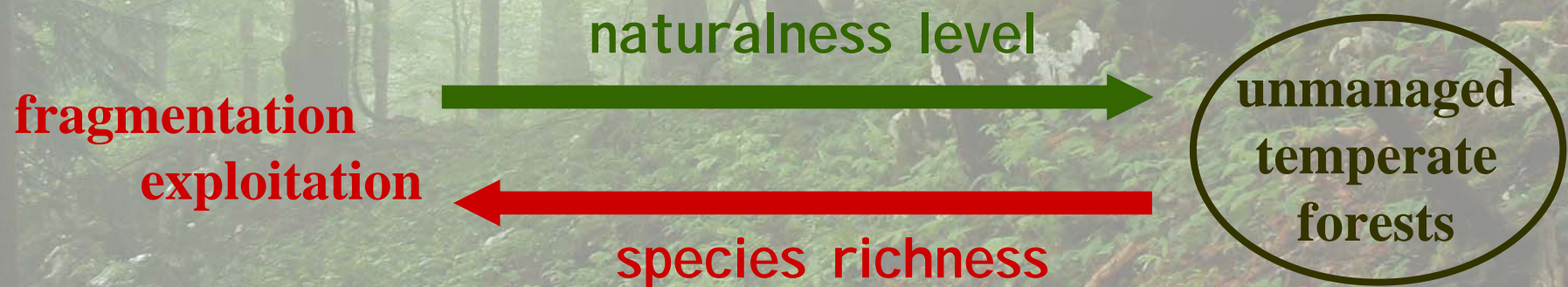
the degree of self-functioning of the natural processes and the intensity of human interventions on the function and structure of ecosystems

In a wide context, naturalness can be considered equivalent to the concept of environmental quality

Naturalness vs. biodiversity?

contradictory or complementary concepts?

Preserving biodiversity by preserving ecosystem naturalness (qualitative approach) ...



A new method for a rapid assessment in the field at stand level... in five steps...

tested in 9 *ForestBIOTA* Level II plots in Italy (years 2003-2004)

1 Determination of the potential vegetation type in the plot

(plant community,
after Pignatti, 1998)

A misty forest scene with tall, moss-covered tree trunks and dense green foliage. The text is overlaid on the left side of the image.

**2 Comparison of actual and potential vegetation types
(according to the tree layer composition)**

3a **NO** → **different types, plantation**

- Not native dominant species
- Native but not-original species

naturalness: 0,0
naturalness: 0,2



3b YES →

**similar types,
site-original species
in tree layer**

- Comparison with the nearest comparable less disturbed stand (“reference”)
- Naturalness: 0,2 – 5.0 (max value – “reference” stand)

➤ Field assessment of six naturalness indices, measured in the sample plot and in the “reference” stand

values arranged into 5 classes, according to
the ratio of coincidence with the indices
values measured in the “reference” plots



4 ASSESSMENT IN THE FIELD OF SIX NATURALNESS INDICES

(values arranged in 20% classes: 1, 2, 3, 4, 5)

5 AVERAGE NATURALNESS VALUE

simple average of six indices values

naturalness: 0,2-5,0

- Possible alternative: star diagram of six indices

NATURALNESS SPECIFIC INDEX NO. 1

- **VD - vegetation disturbance**

% total coverage of potential-like vegetation type, taking into account the secondary substitute micro-communities

naturalness: 2-5

NATURALNESS SPECIFIC INDEX NO. 2

- **CC - Chorotypes coherence**

total sum of species with local chorological types vs. alien and large-distribution types

naturalness: 2-5

NATURALNESS SPECIFIC INDEX NO. 3

- **SS – Site-original species**

no. of site-original species vs. non site-original and alien species

naturalness: 2-5

NATURALNESS SPECIFIC INDEX NO. 4

- **SR – Species richness**

total no. of vascular species (1/x)

naturalness: 2-5

(comparison with the “reference” stand)

NATURALNESS SPECIFIC INDEX NO. 5

- *SD – Species diversity*

Shannon index calculated on phytosociological tables, taking into account the coverage values of each species (1/x)

naturalness: 2-5

(comparison with the “reference” stand)

NATURALNESS SPECIFIC INDEX NO. 6

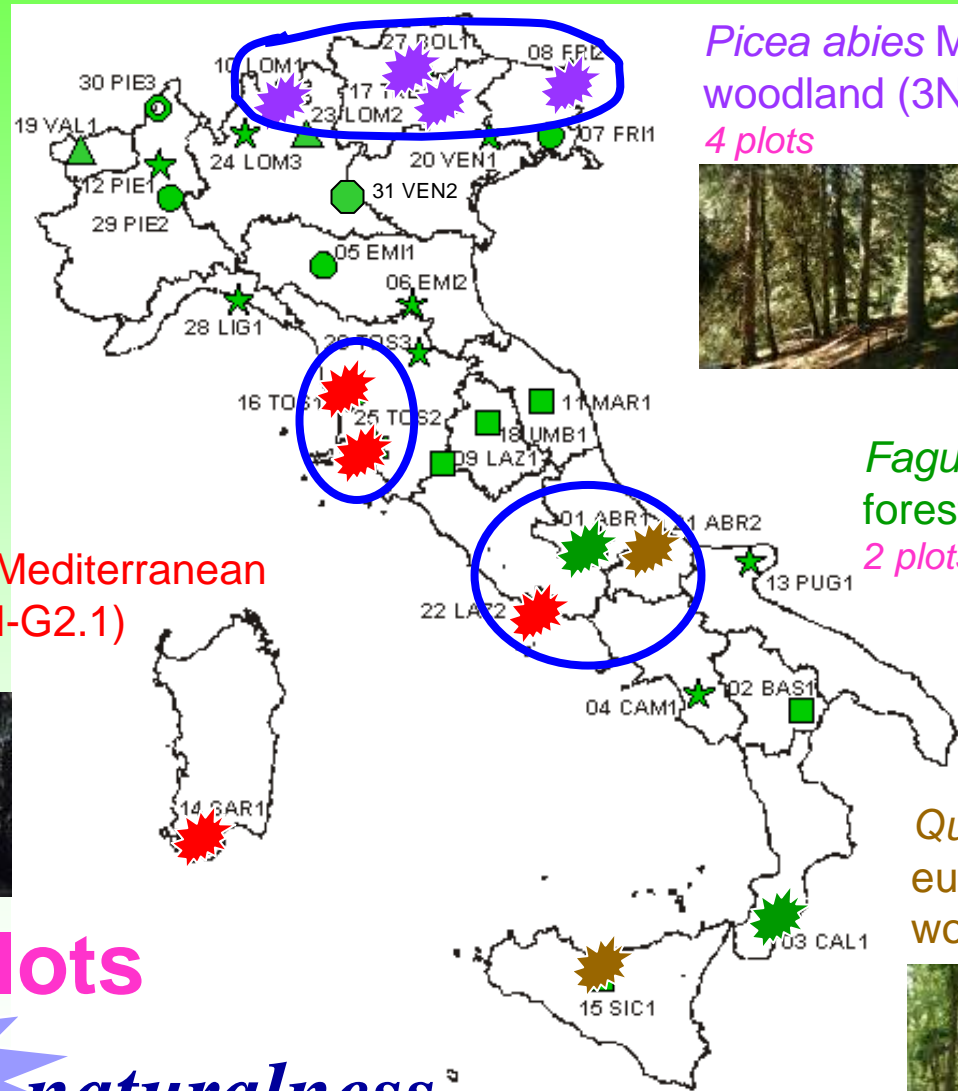
- *EV – evenness*

Evenness index calculated on phytosociological tables, taking into account the coverage values of each species (1/x)

naturalness: 2-5

(comparison with the “reference” stand)

CONECOFOR Lev. II permanent plots selected for ForestBIOTA



Picea abies Mountain woodland (3N.1)
4 plots



Fagus sylvatica Mountain forest (1N.3b)
2 plots



Quercus ilex Mediterranean woodland (2N-G2.1)
4 plots



Quercus cerris eu-mesotrophic woodland (1N.7)
2 plots



12 plots

9 plots *naturalness*

Dynamical tendencies

12 plots

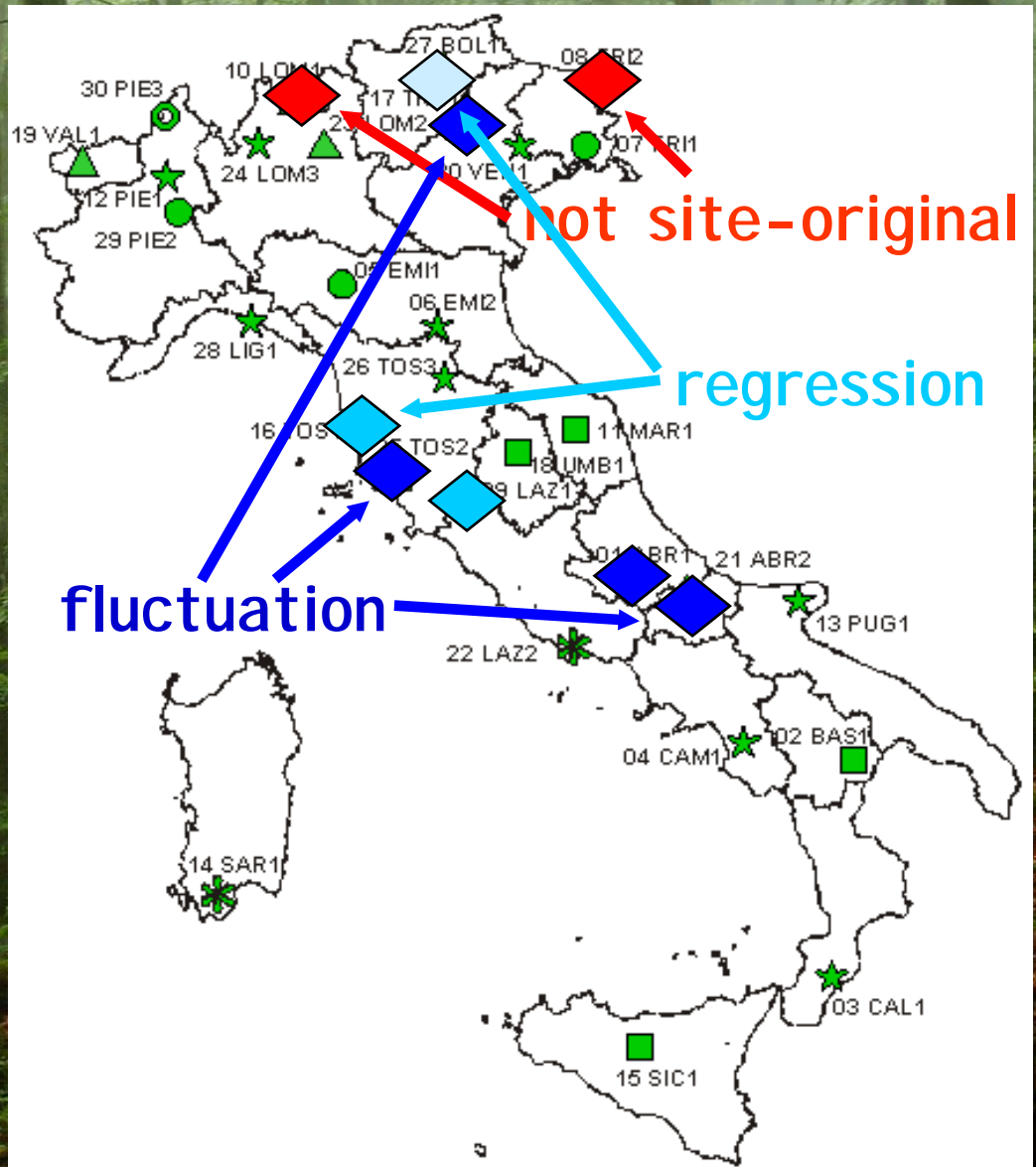
Plot	Tree age	Syntaxon	Vascular species no.	Tree layer species no.	Vegetation main dynamical tendency
ABR1	110	<i>Polysticho-Fagetum</i>	48	1	regeneration
CAL1	110	<i>Aquifolio-Fagetum</i>	73	3	fluctuation (regeneration)
FRI2	70	<i>Veronico uticifoliae-Piceetum</i>	78	5	regeneration
LOM1	50	<i>Veronico uticifoliae-Piceetum</i>	92	14	regeneration (fluctuation)
TRE1	110	<i>Homogyno-Piceetum</i>	31	2	fluctuation
BOL1	110	<i>Homogyno-Piceetum</i>	54	5	regression
SIC1	30	<i>Quercetum gussonei</i>	81	1	regression
ABR2	130	<i>Aceri lobelii-Fagetum abietetosum albae</i>	66	12	fluctuation
SAR1	110	<i>Viburno-Quercetum ilicis</i>	38	5	regression
TOS2	30	<i>Viburno-Quercetum ilicis</i>	20	5	fluctuation
TOS1	30	<i>Orno-Quercetum ilicis</i>	54	15	regression
LAZ2	40	<i>Orno-Quercetum ilicis</i>	29	6	regeneration

NATURALNESS LEVEL

(from 0,0 to 5,0), based on simple average of indices values (classes: 1-5, 20% intervals)

Naturalness classes

- ◆ 1 – 0-20%
- ◆ 2 – 20-40%
- ◆ 3 – 40-60%
- ◆ 4 – 60-80%
- ◆ 5 – 80-100%



**For more information, please visit
web sites:**

CONECOFOR & LTER-Italia

***<http://www.corpoforestale.it>*
*(see CONECOFOR part)***

SEBI2010

<http://biodiversity-chm.eea.eu.int/information/indicator>

ALTER-Net

<http://www.alter-net.info/>

ForestBIOTA

<http://www.forestbiota.org>