

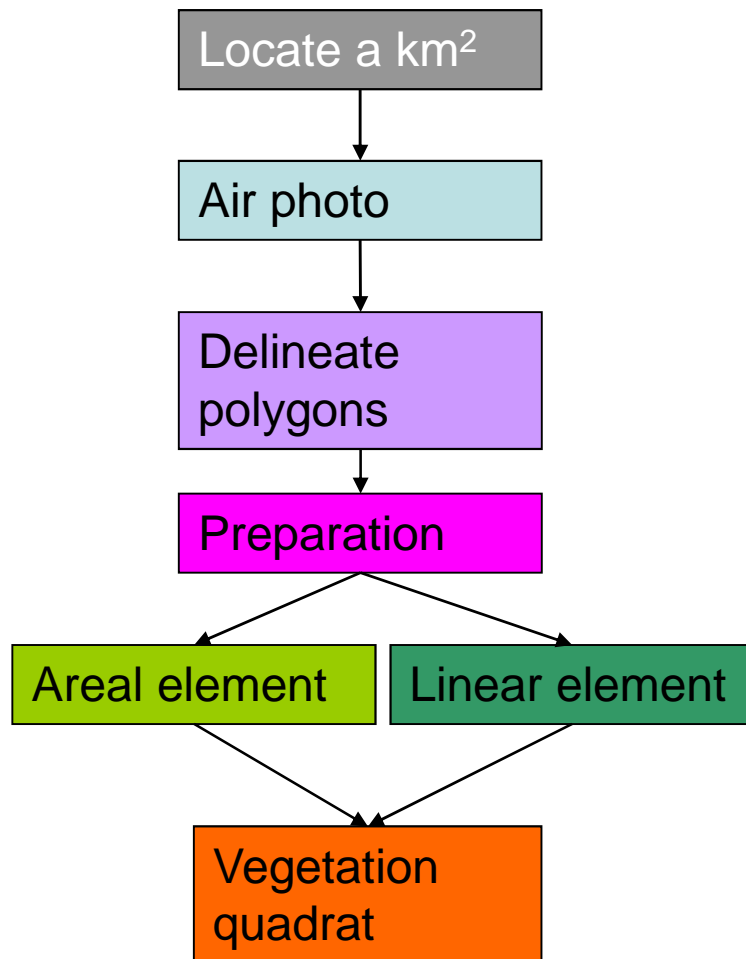


**EBONE**

# Habitat mapping strategy

Marion Bogers  
Ilse Geijzendorffer  
Bob Bunce

# From start to finish



1. Locate your km<sup>2</sup>
2. Air photo
3. Delineate polygons
4. Preparation

Walking the grid:

5. **Areal elements**
6. **Linear elements**
7. **Vegetation quadrat**

# 1. Locate a km<sup>2</sup>

Where to place your km<sup>2</sup>?

1. Take the grid EnS
2. Select a square you like



Cadalso



# 1. Air Photo

Use Air Photographs  
or Satellite images

As much information  
as you can.

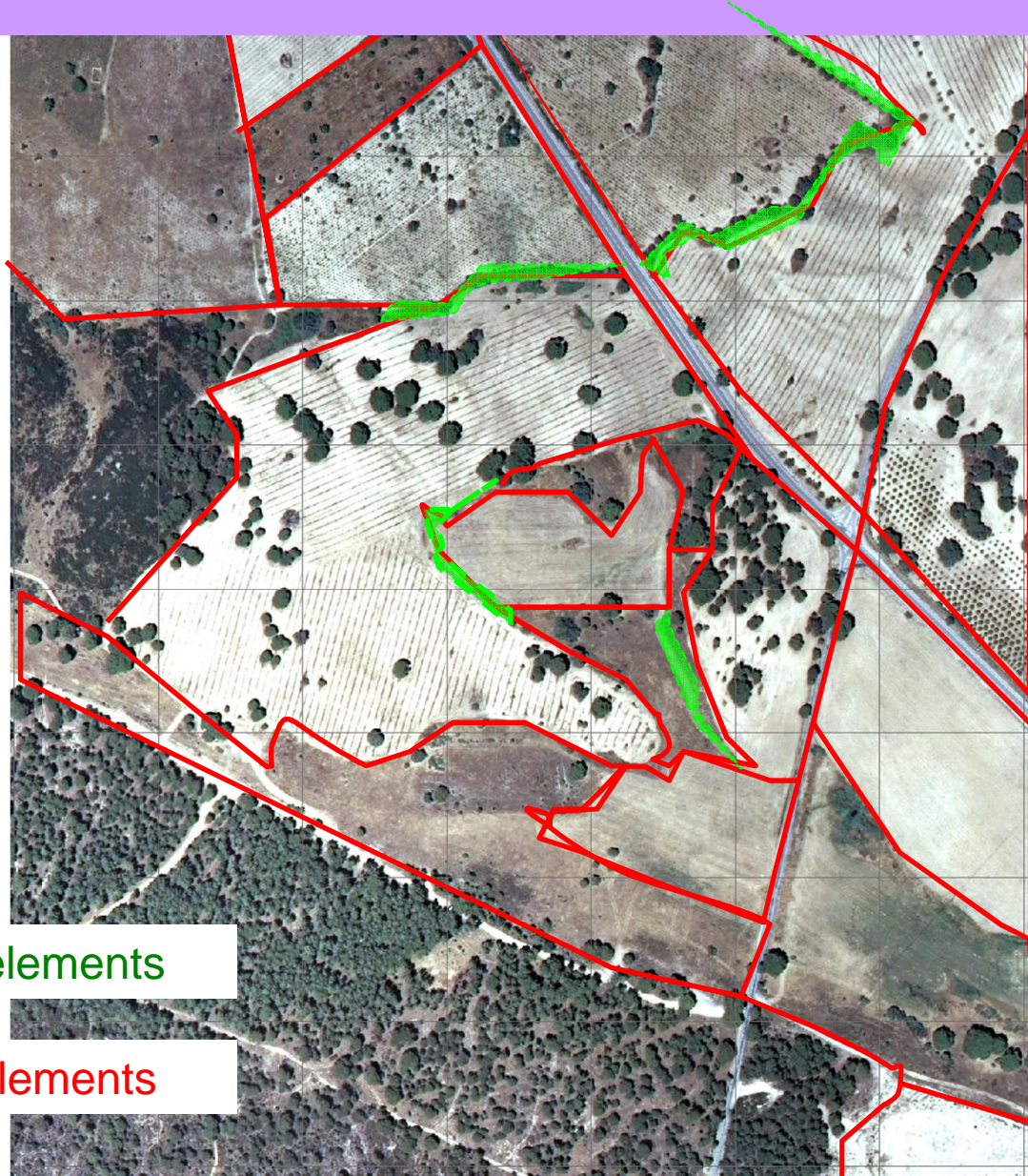
For fieldwork quality,  
at least 1: 10.000



Cadalso



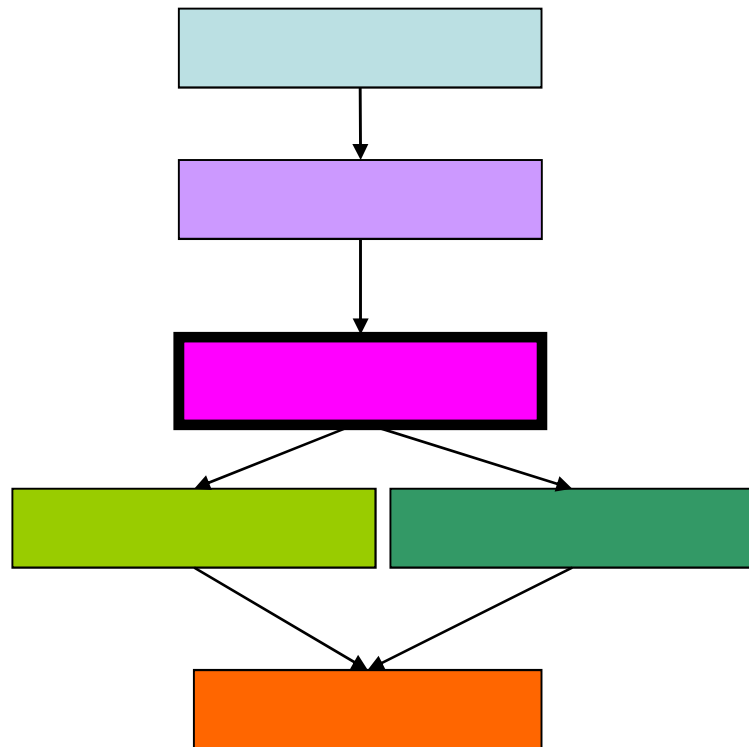
## 2. Delineate Polygons



Potential Linear elements

Potential Areal elements

## 4. Preparation



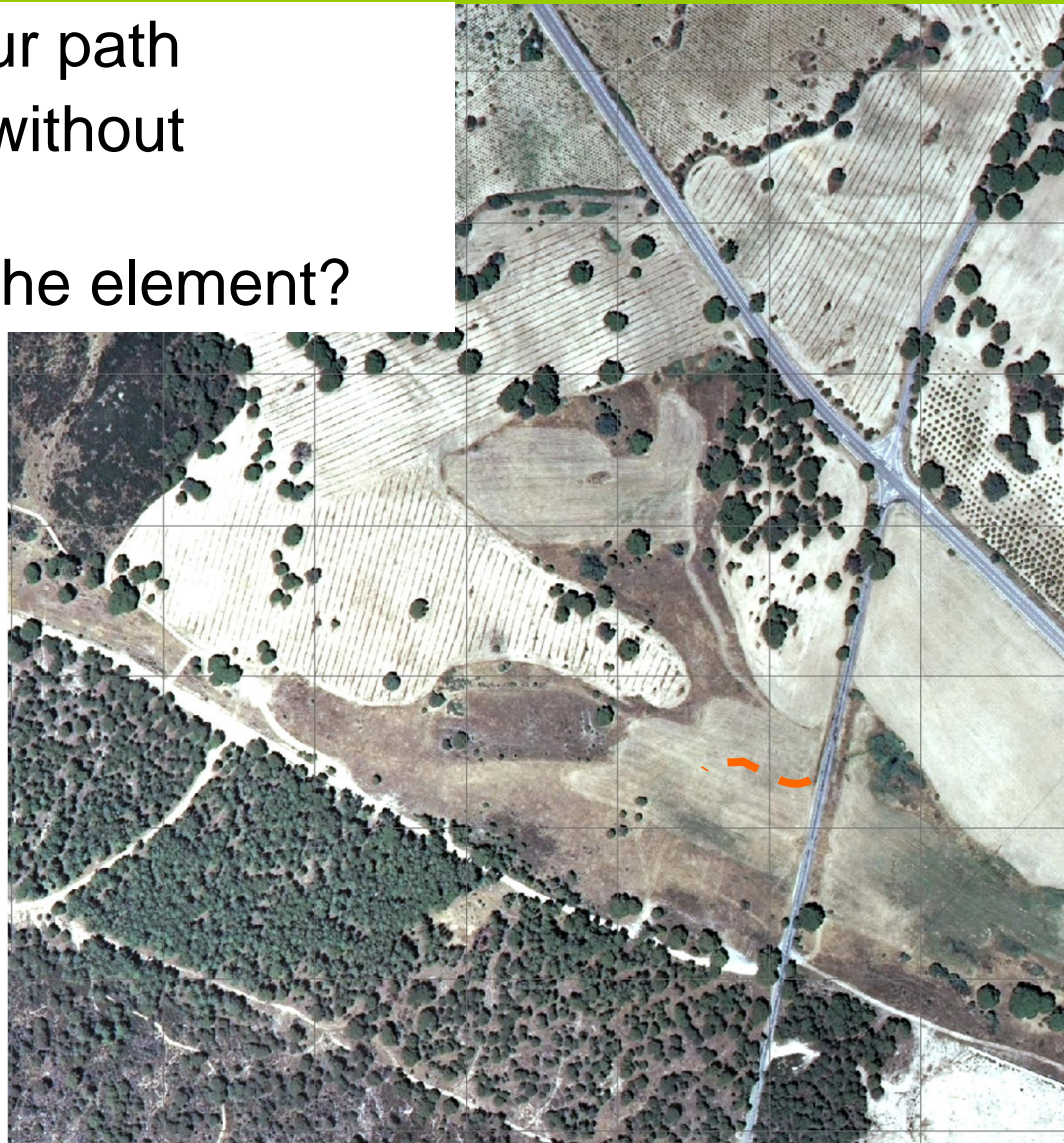
What to take:

- A field computer/ recording sheets
- Manual and field key
- Aerial photographs (multiple at least 2) or overlays or pre-prepared boundaries
- Pencils or markers
- Other essentials



# *Walking the grid: 5. Areal elements*

- Think of your path
- Procedure without delineation
- How big is the element?

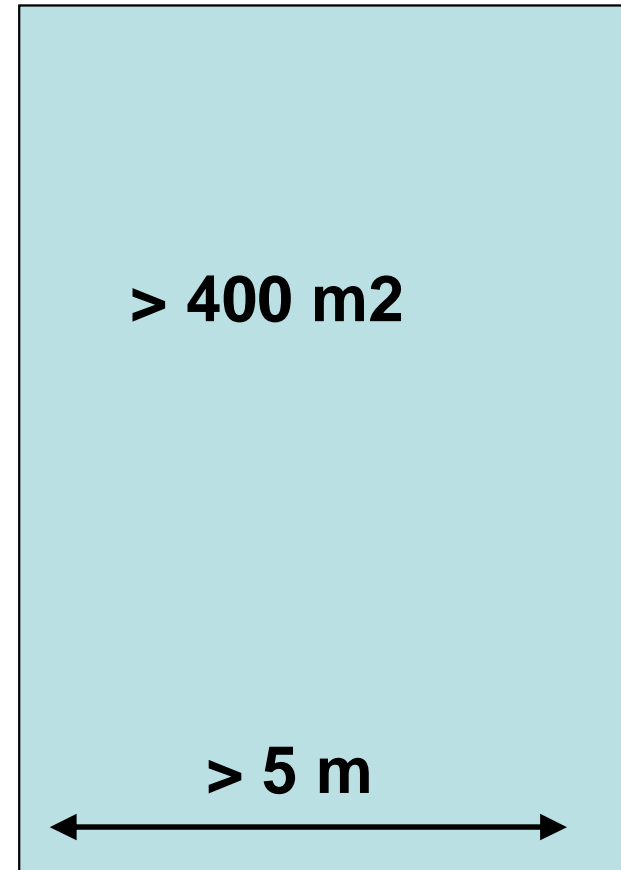
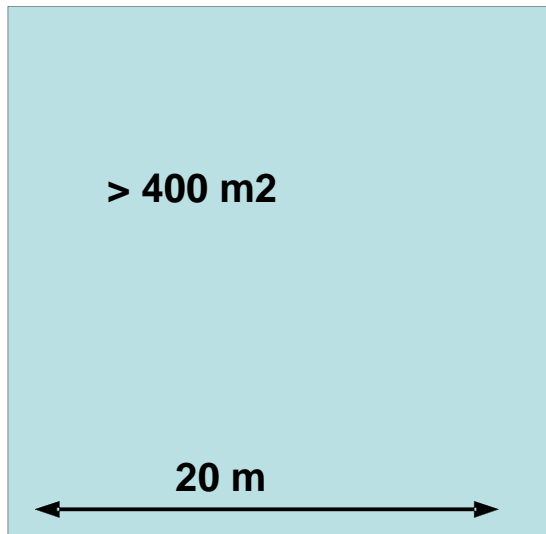




# The recorded elements

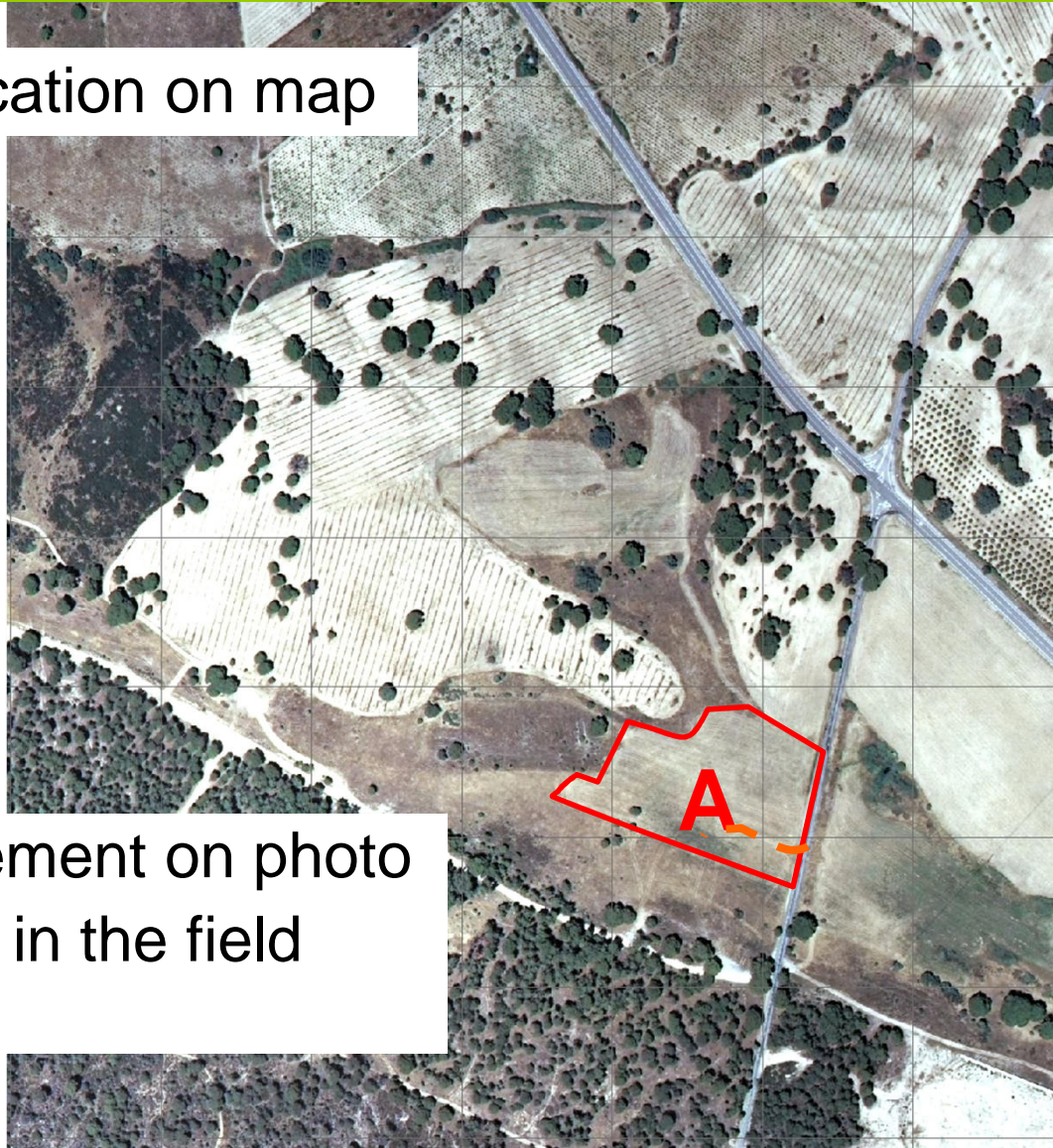
An **Areal element** is:

- minimal 400 m<sup>2</sup> with a minimum width of 5 m. wide.



# *Walking the grid: 4. Areal elements*

Draw location on map



Label the element on photo  
and record it in the field  
computer

# Habitat recording

[illegible]

First Areal element  
to be recorded

Have no fear for what you are about to see:

- Category lists are extensive and do not have to be known by heart, they're in the manual

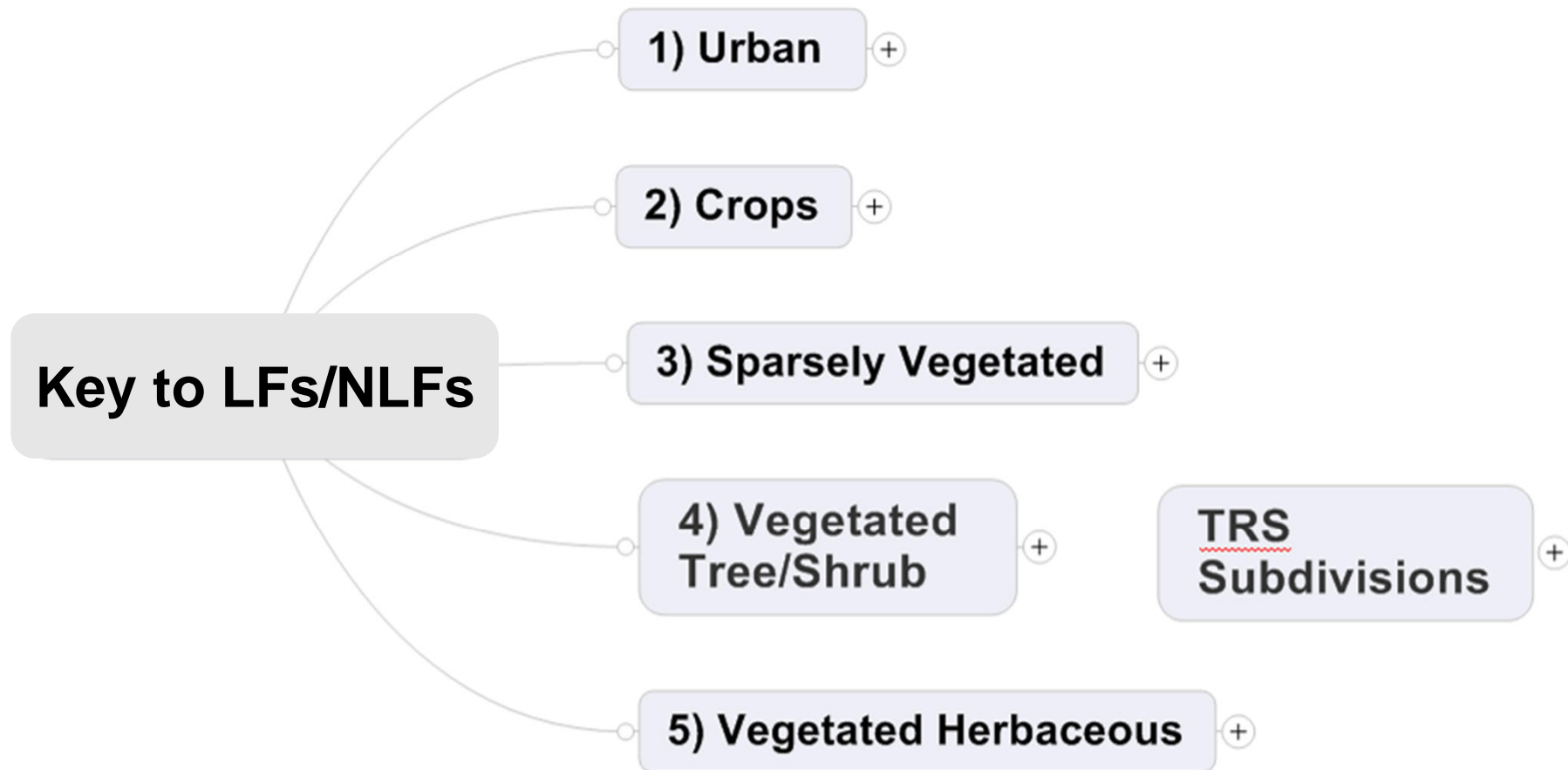


# Rules for recording Non-LF and LF

- View the LFs and NLFs as seen from above (areal photograph)
- Record all LFs and NLFs with  $> 10\%$  coverage
- Taken all together these LFs and NLFs should add up to 100%.
- In deserts or bare rock where the vegetation cover is  $< 10\%$  also LFs below 10% are recorded.
- Crop Fields are recorded as a 100% LFs

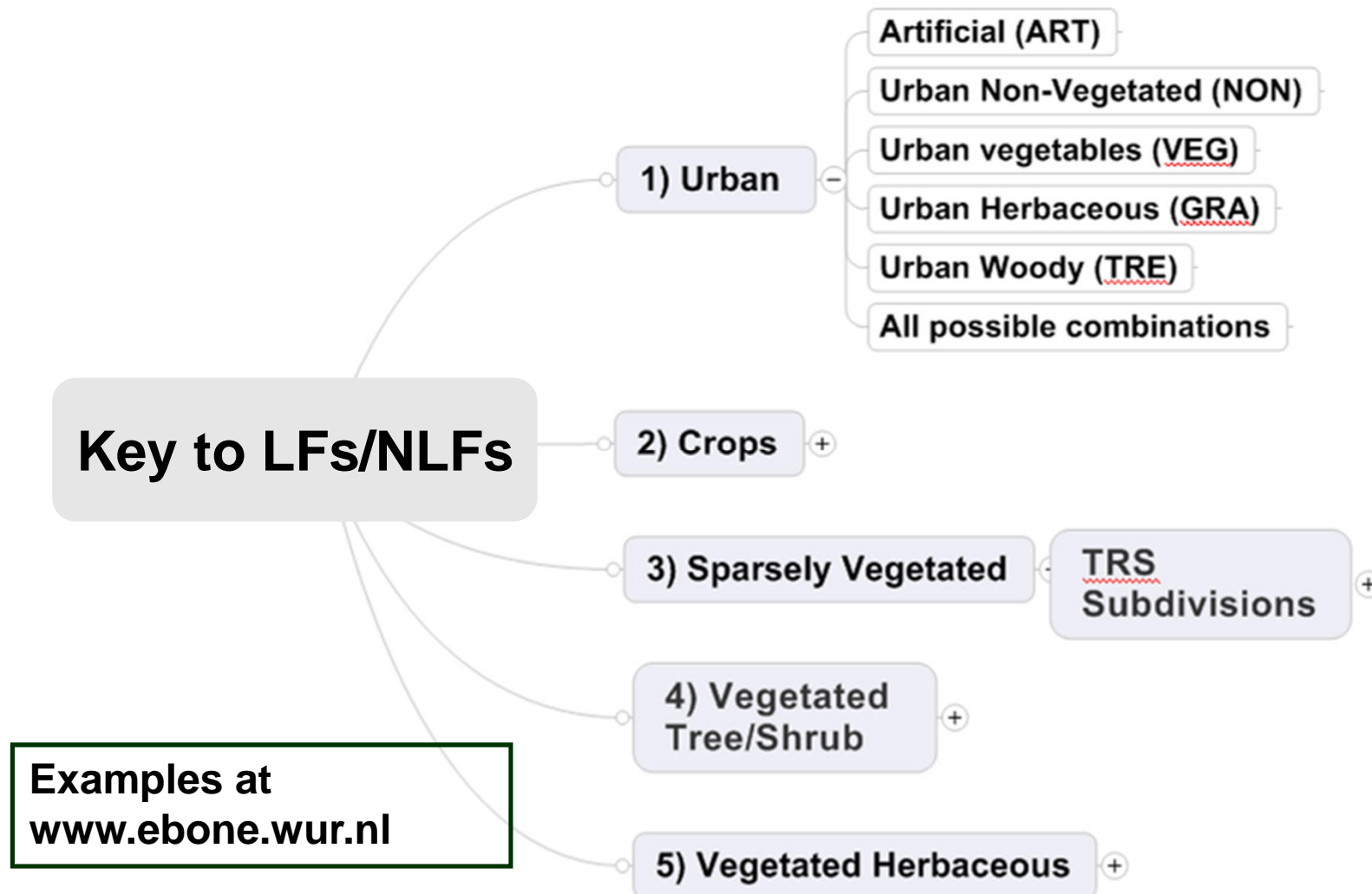
# Life forms and Non-Life Forms

- Supercategories



# Life Forms and Non Life Forms

- General categories 2nd layer





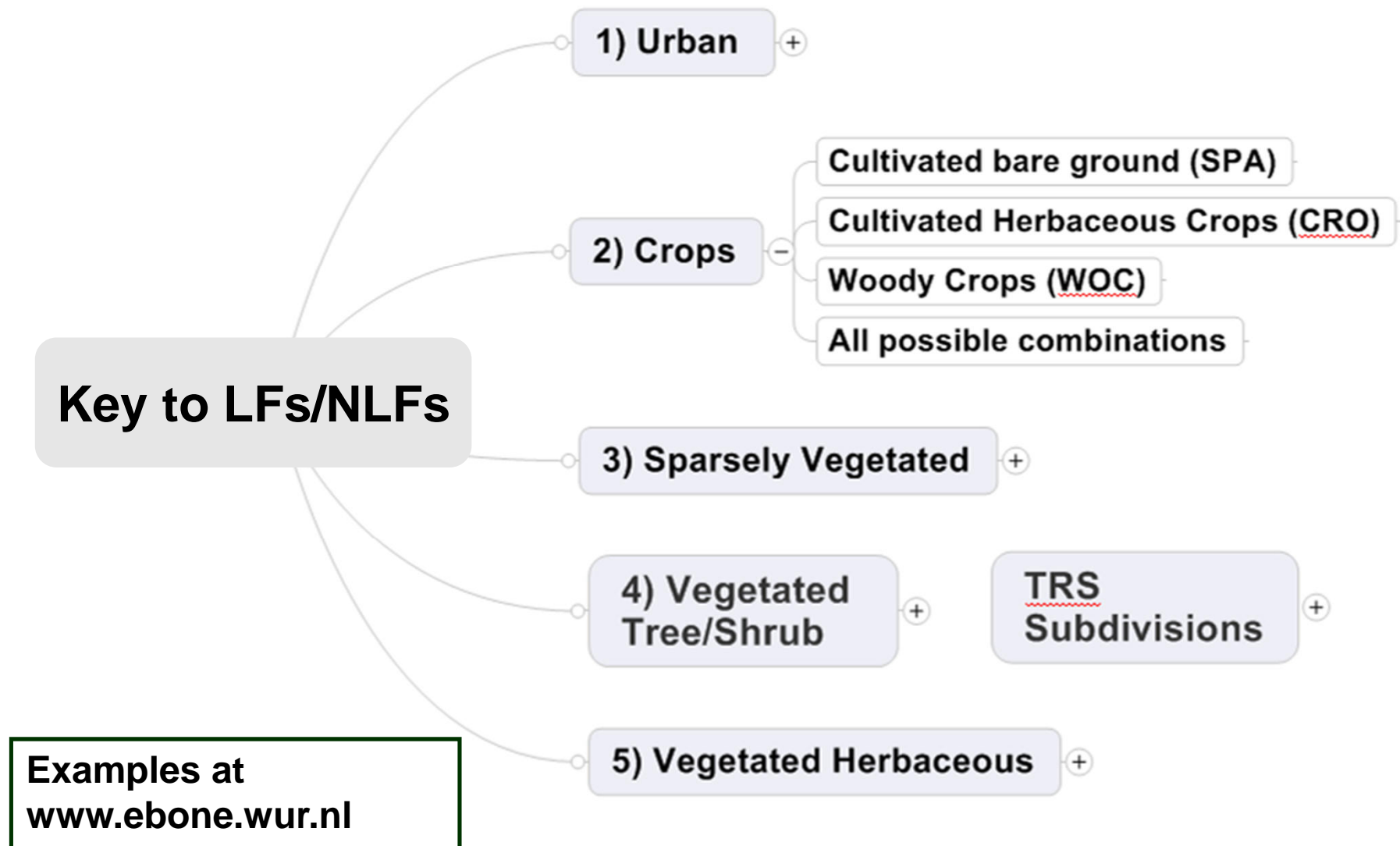


**TRE**



**NON**

# Life Forms and Non Life Forms

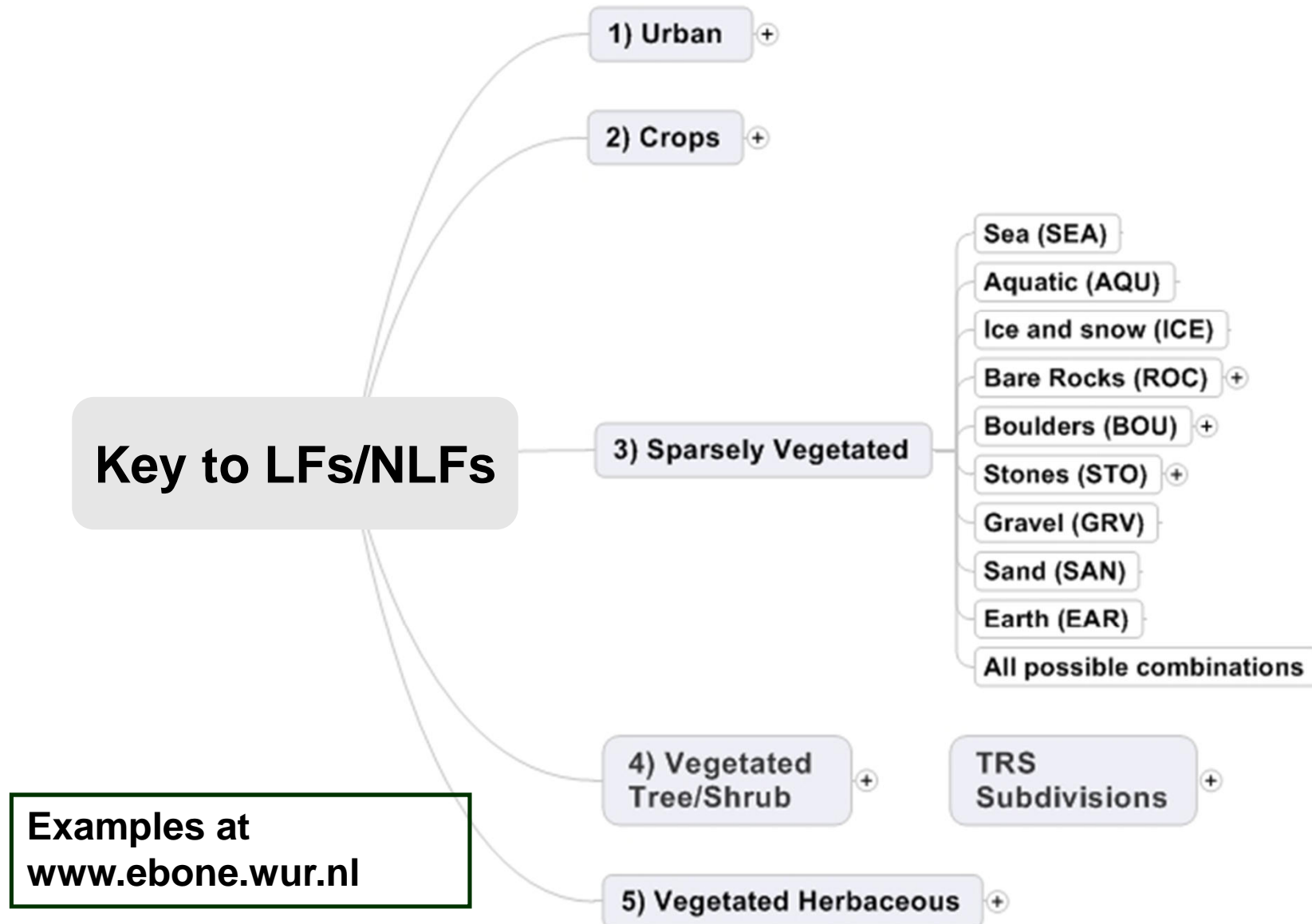








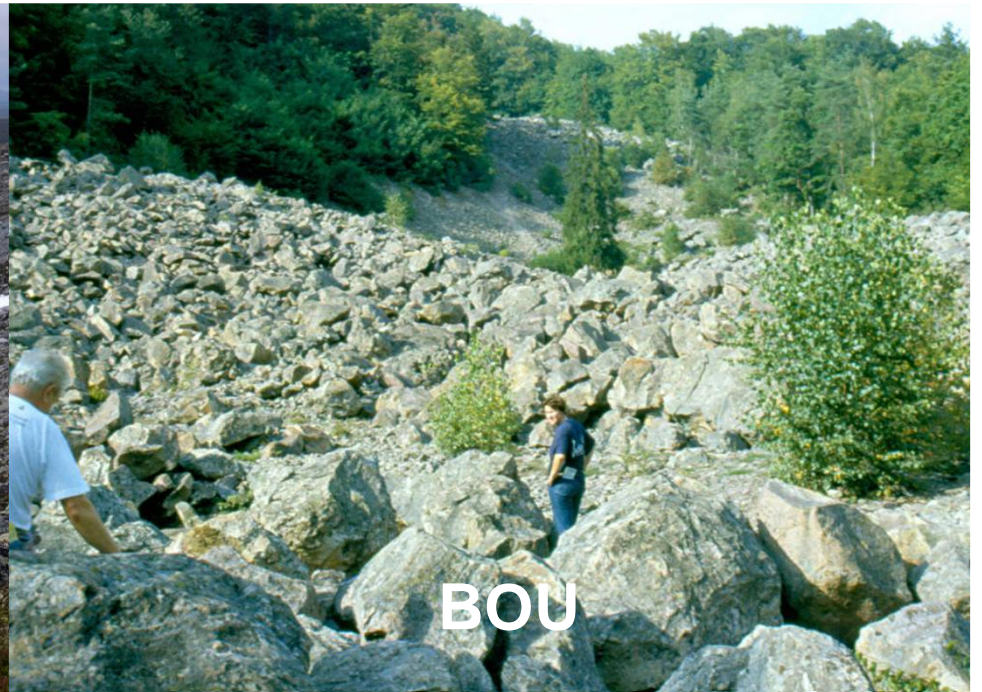
# Life Forms and Non Life Forms







ICE



BOU



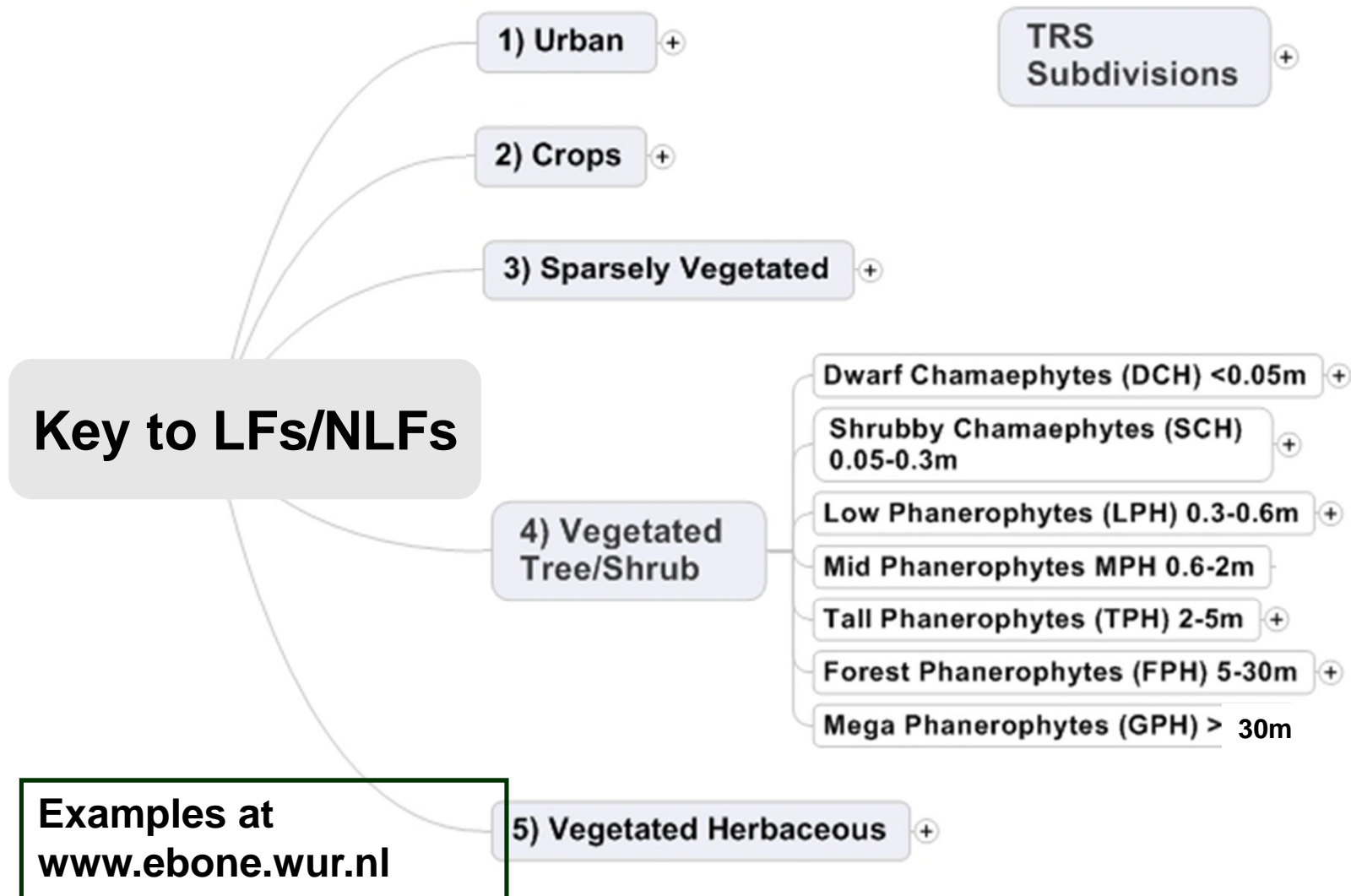
SAN



ROC

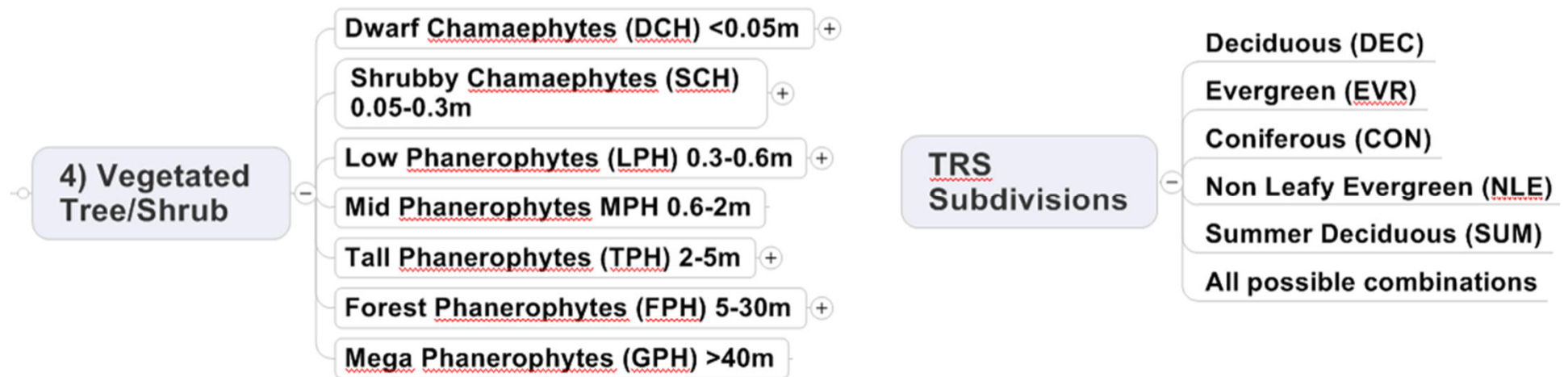


# Life Forms and Non Life Forms



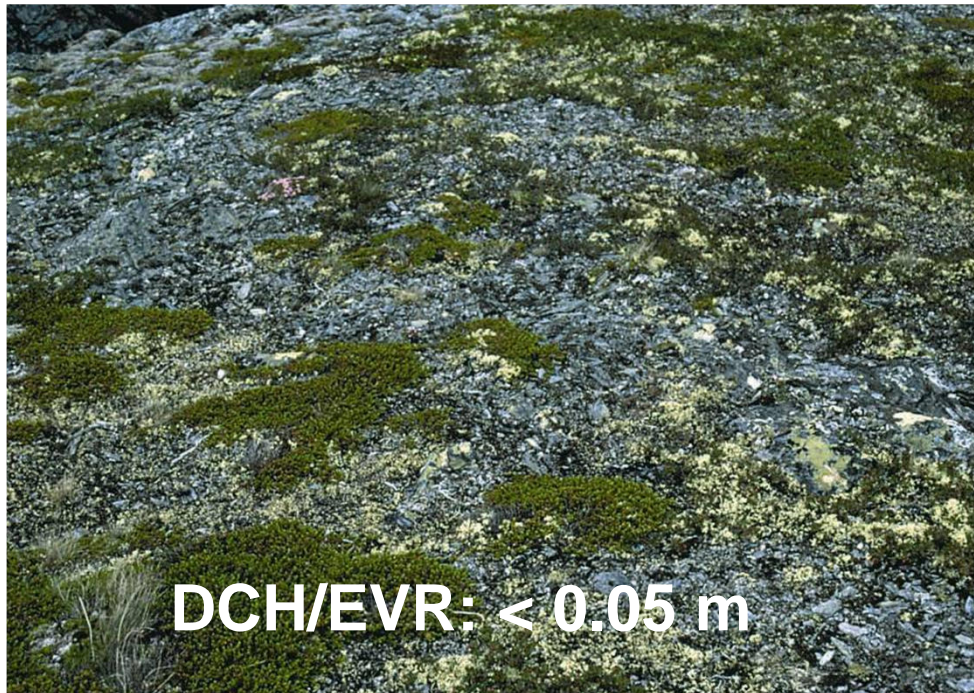


# Life Forms and Non Life Forms



Examples at  
[www.ebone.wur.nl](http://www.ebone.wur.nl)





**DCH/EVR: < 0.05 m**



**LPH/EVR: 0.3-0.6 m**



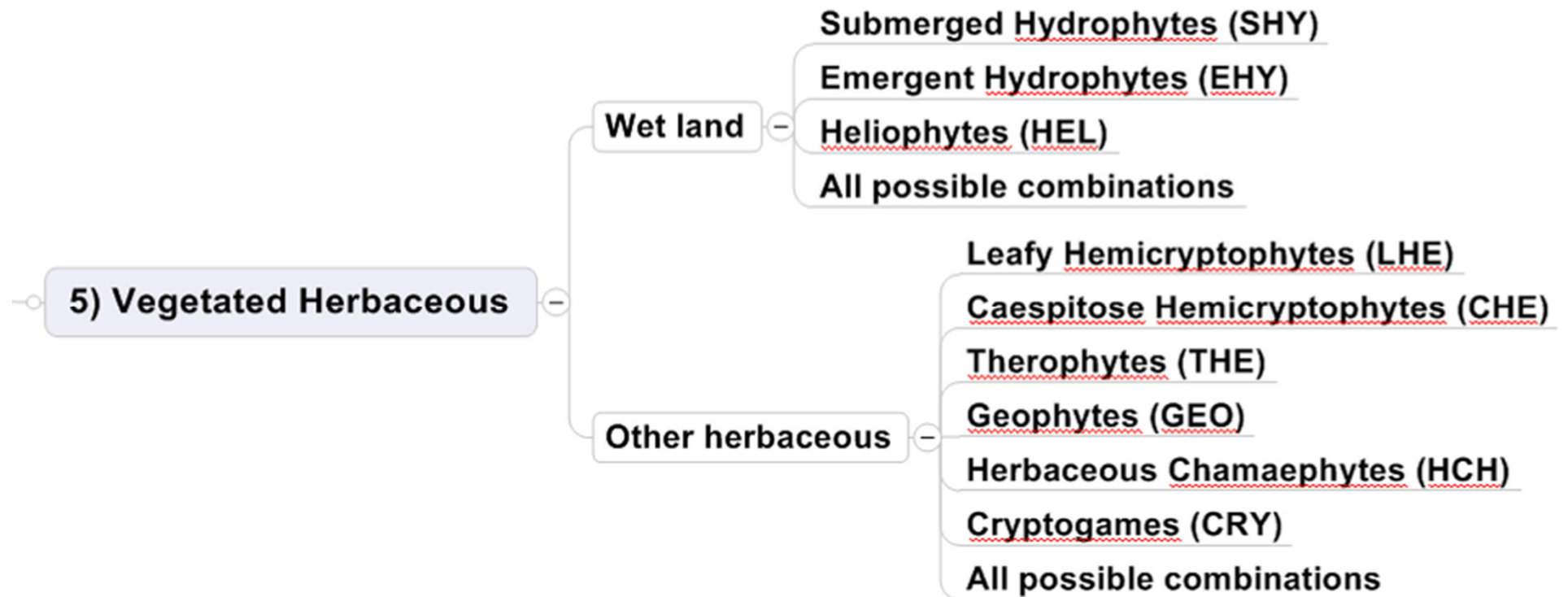
**TPH/DEC: 2-5 m**



**MPH/CON: 0.6-2 m**

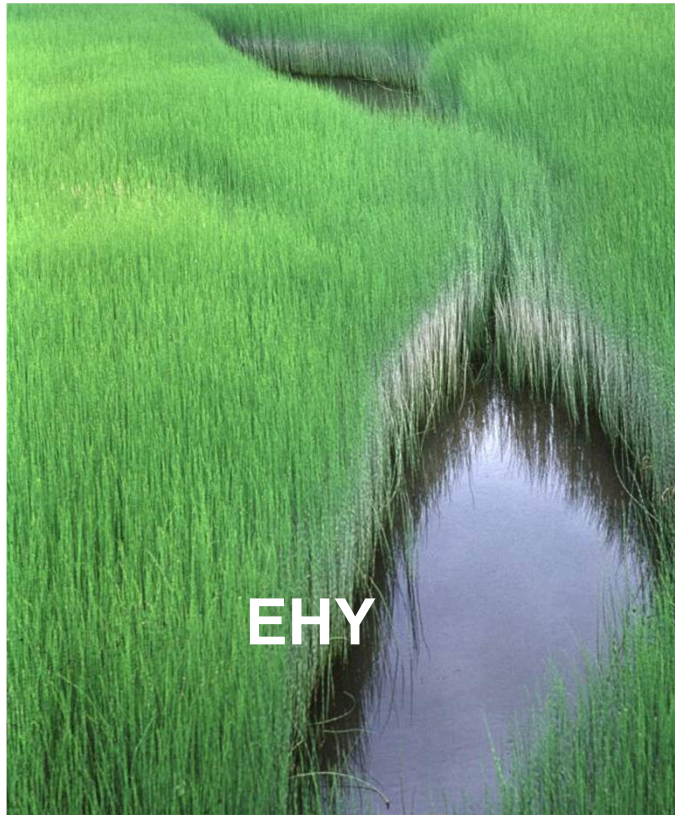


# Life Forms and Non Life Forms



Examples at  
[www.ebone.wur.nl](http://www.ebone.wur.nl)





EHY



CHE



THE



CRY



# General Habitat Category

GHC based on Non Life Forms =

Vegetation cover <30% ( e.g. ART, ICE, STO)

GHC based on Life Forms =

Vegetation cover >30% (e.g. CHE, SCH, FPH)

- **Is the total surface covered by**
  - trees and shrubs = or > 30%?  
**Vegetated tree/shrub**
  - wetland herbaceous plants = or > 30%?  
**Herbaceous HEL, SHY or EHY**
  - Other herbaceous plants = or > 30%?  
**Other, see page 22**

# General Habitat Category

- GHC can be indicated by one, two or three codes (e.g. LHE/CHE, FPH/DEC/CON)
- IF an element consists of two LFs or NLFs
- AND neither LFs or NLFs have a coverage of < 70%
- THEN the element is recorded as a GHC consisting of two or three codes.

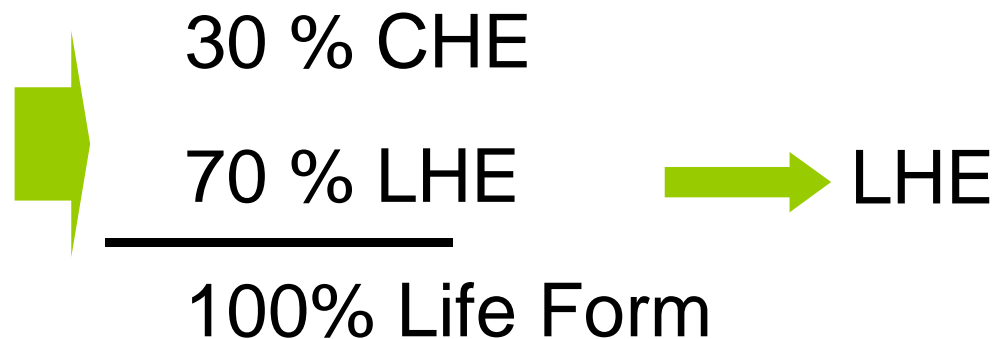
% <b>FPH/DEC</b>	% <b>FPH/CON</b>	GHC to be recorded
20	80	FPH/CON
60	40	FPH/DEC/CON



# GHC: A mixture of LFs or NLFs

## EXAMPLE

- 30% EAR
- 20% CHE
- 50% LHE



# Complex habitats

Precedence rules for 30 30 30 % cover

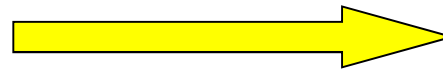
Herbaceous vegetation:

See Page 40

Habitats are ranked by increasing rarity

Take the top 2 from the table

% cover	Habitats
30	LHE
30	CHE
30	CRY

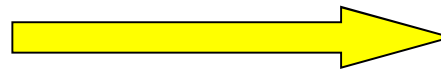


LHE/CHE

Forestry vegetation:

Canopy height is leading  
page 51

% cover	Habitats
30	LPH
30	MPH
30	TPH



TPH/DEC

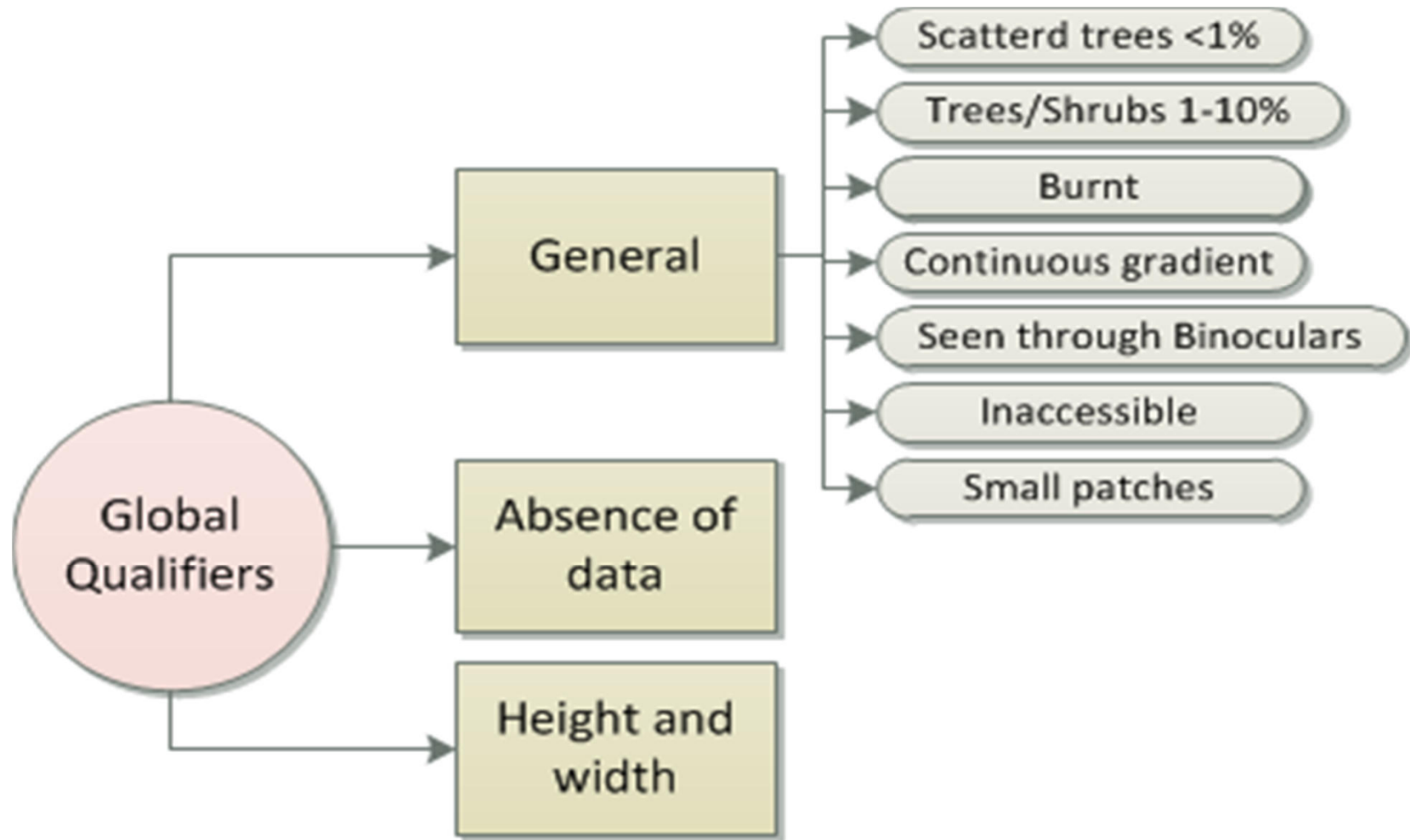


# Habitat recording

code	Field 1	Field 2	Field 3	Field 4	Field 5				Field 6
$\alpha$	General Habitat Category	Global/ Env. Qualifie r	Site Qualifie r	Man. Qualifi er	LFs /NLFs /Species				Annex I
					Full of /NLFs	list LFs	%	Species	%
A	LHE/CHE				LHE	40	Lol per	90	
					CHE	60	Tri rep	50	

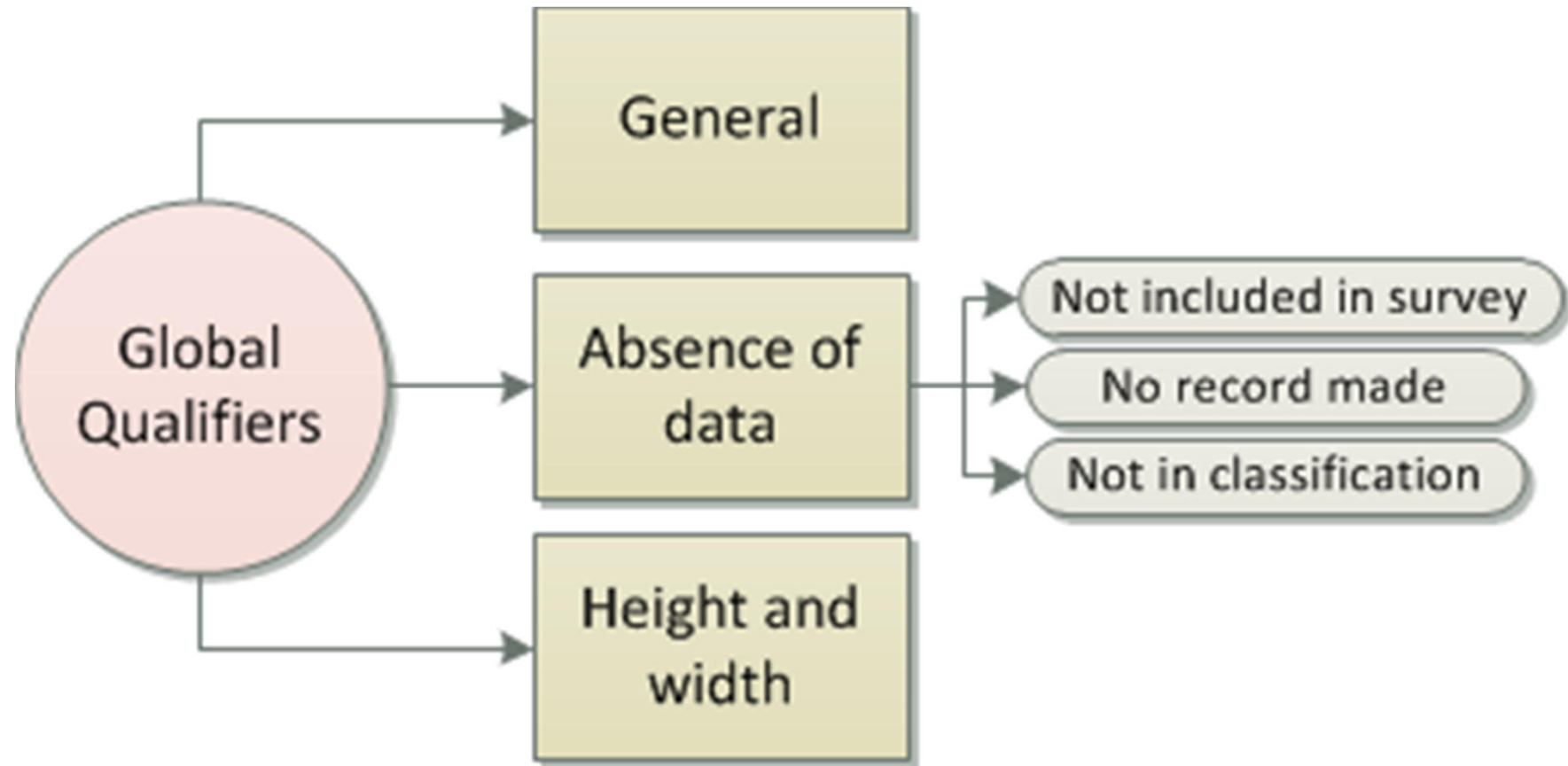
Herbaceous mixed grassland = LHE/CHE

# Global Qualifiers





# Global Qualifier



# Environmental qualifier

Indicates Humidity and acidity

Only for GHC containing Life Forms

Table 1. Matrix and unique coding of Environmental Qualifiers. In general, acid is below pH 4.8; neutral is between pH 4.8 and 6.0; basic is over pH 6.0.

	Ellenberg values	Aquatic	Water logged	Seasonally wet	Wet	Mesic	Dry	Very	Xeric	Semi	Desert
Eutrophic	F > 7	1.1	2.1	3.1	4.1	5.1	6.1	<b>Indicators:</b>  Plant indicators or plant combinations  Ellenberg values  Soil type  Landscape context			
Acid		1.2	2.2	3.2	4.2	5.2	6.2				
Neutral		1.3	2.3	3.3	4.3	5.3	6.3				
Basic		1.4	2.4	3.4	4.4	5.4	6.4				
Saline low		1.5	2.5	3.5	4.5	5.5	6.5				
Saline medium		1.6	2.6	3.6	4.6	5.6	6.6				
Saline high		1.7	2.7	3.7	4.7	5.7	6.7				



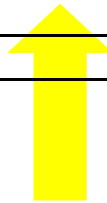
# Indicator plants to determine the environmental qualifier



*Rumex  
acetosella*

# Habitat recording

code	Field 1	Field 2	Field 3	Field 4	Field 5				Field 6
$\alpha$	General Habitat Category	Global/ Env. Qualifier	Site Qualifier	Man. Qualifier	LFs /NLFs /Species				Annex I
					Full of /NLFs	list of LFs	%	Species	
A	LHE/CHE		3.12/4.1		LHE		40	Lol per	90
					CHE		60	Tri rep	50



You may use several codes if you need to:

e. g. : 3.12/4.1

Sandy soil and Evidence of previous water cover

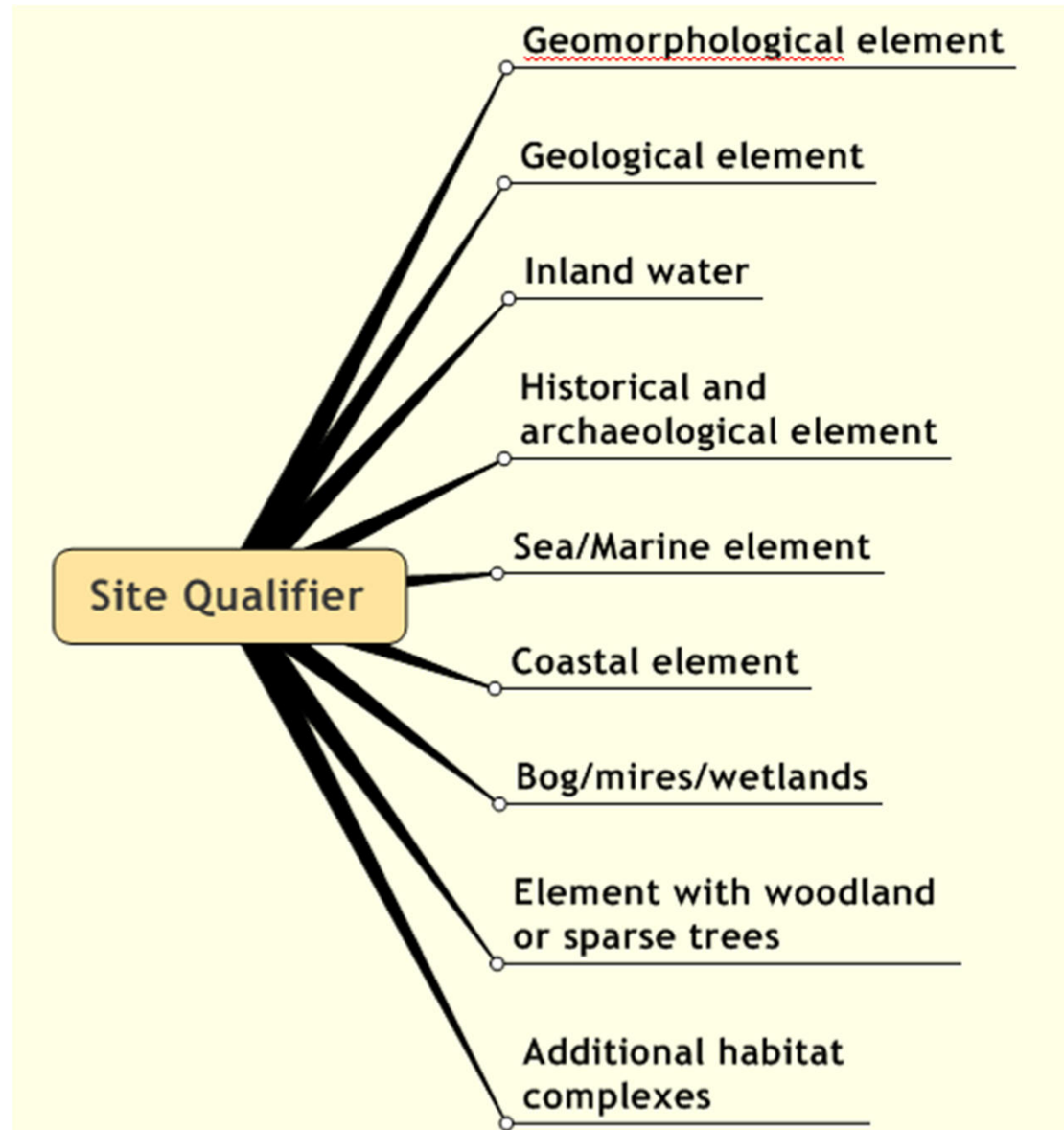


# Site qualifier

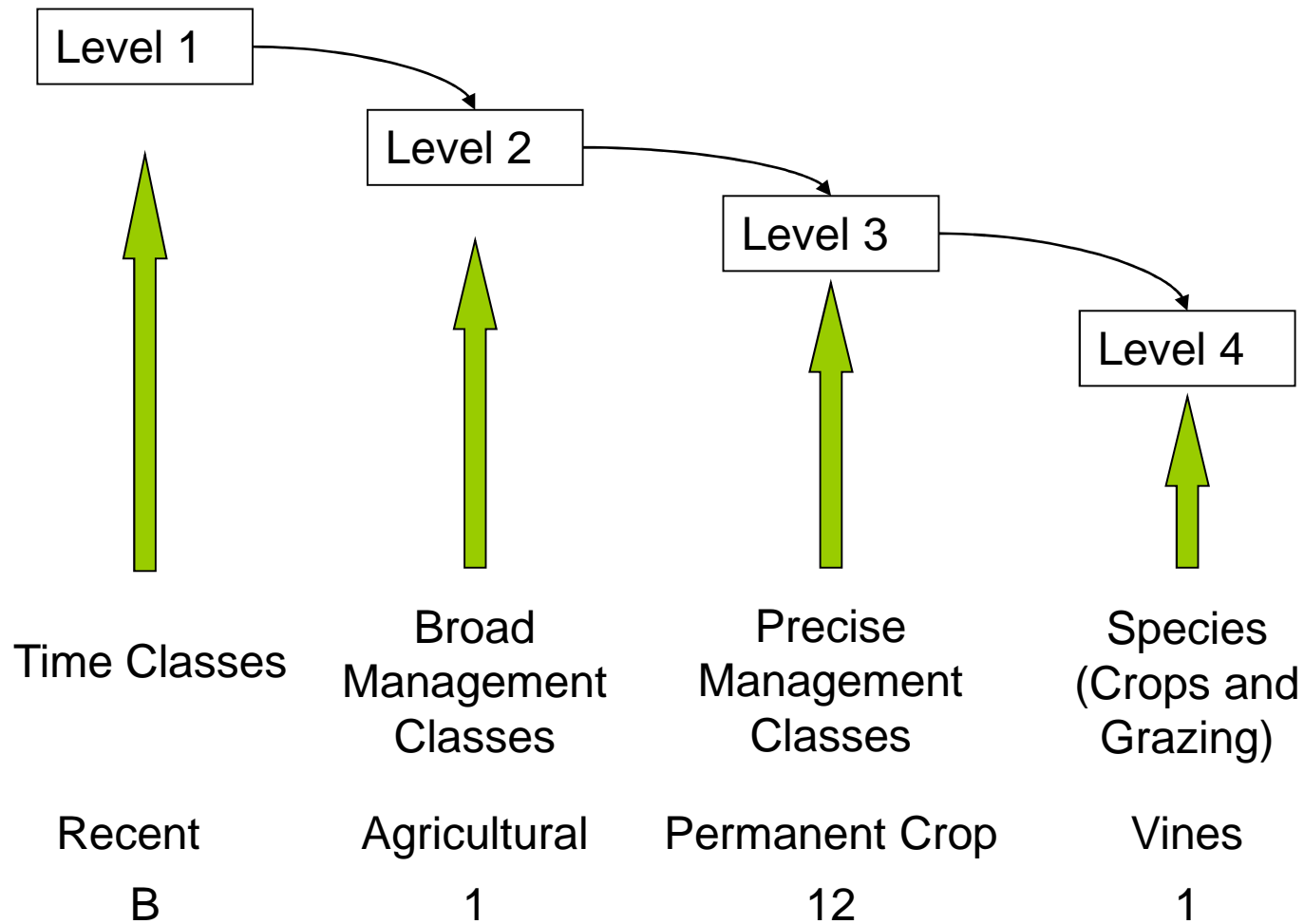
Physical  
description of  
location

New categories  
possible, but  
require...

**Bunce**



# Management qualifier



**B.1.12.1**



# Habitat recording

code	Field 1	Field 2	Field 3	Field 4	Field 5				Field 6
$\alpha$	General Habitat Category	Global/ Env. Qualifie r	Site Qualifie r	Man. Qualifi er	LFs /NLFs /Species				Annex I
					Full of /NLFs	list LFs	%	Species	
A	LHE/CHE		3.12/4.1	A1.7.7	LHE		40	Lol per	90
					CHE		60	Tri rep	50

Level 1

Level 4

Level 2 & 3

Multilevel coding for management  
Crops are included in the  
management qualifiers

# Species recording

- Record all species > 30% cover within that habitat.
- If no species with more than 30%, then the two species with the highest cover are recorded.
- The name of the species can be abbreviated using the first three letters, e.g. *Fag syl*.
- Also the % of the cover of the species is indicated. Note that this is the percentage within the habitat, not of the whole element.

# Habitat recording

code	Field 1	Field 2	Field 3	Field 4	Field 5				Field 6
$\alpha$	General Habitat Category	Global/ Env. Qualifie r	Site Qualifie r	Man. Qualifi er	LFs /NLFs /Species				Annex I
					Full of /NLFs	list LFs	%	Species	%
A					LHE	40	Lol per	90	
					CHE	60	Tri rep	50	





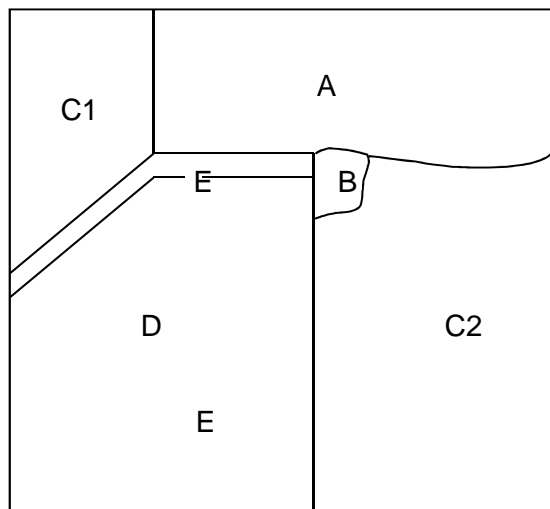
# Annex I Habitats

- There are no easy guidelines to Annex I habitats.
- You have to use the key
- See “Rule based system for Annex I Habitats”

Download from EBONE intranet

- Or use the field computer version (PDA)

# Example of the mapping and recording of areal elements



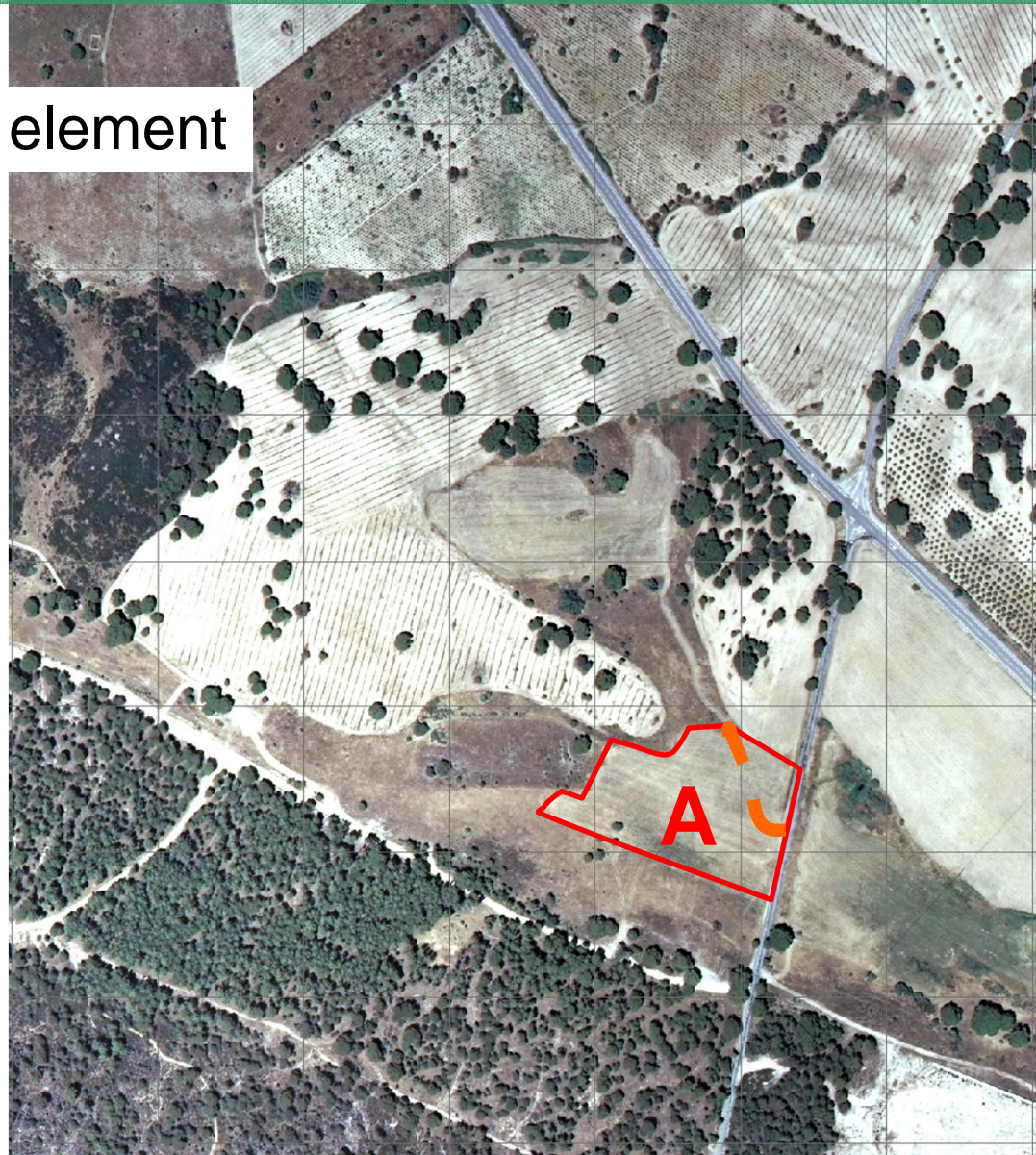
code	Field 1	Field 2	Field 3	Field 4	Field 5				Field 6
$\alpha$	General Habitat Category	Global/Env. Qualifier	Site Qualifier	Man. Qualifier	Habitats/Species				Annex I
					Life form and Non Life Form	%	Species	%	
A	CHE	5.3	0	A1.6.7	CHE	90	Lol per	100	
					THE	10	Poa ann	60	
B	ART	0	5.1	0	ART	70			
					NON	30			
C	CRO	0	0	A1.1.1	CRO	100	Wheat	100	
D	LHE/CHE	5.3	1.18/3.8	A1.8	LHE	60	Chr leu	10	
					CHE	40	Agr cap	50	
E	NON	0	0	A5.21	0				

# *Walking the grid: 6. Linear elements*

Done!! & Walk to next element

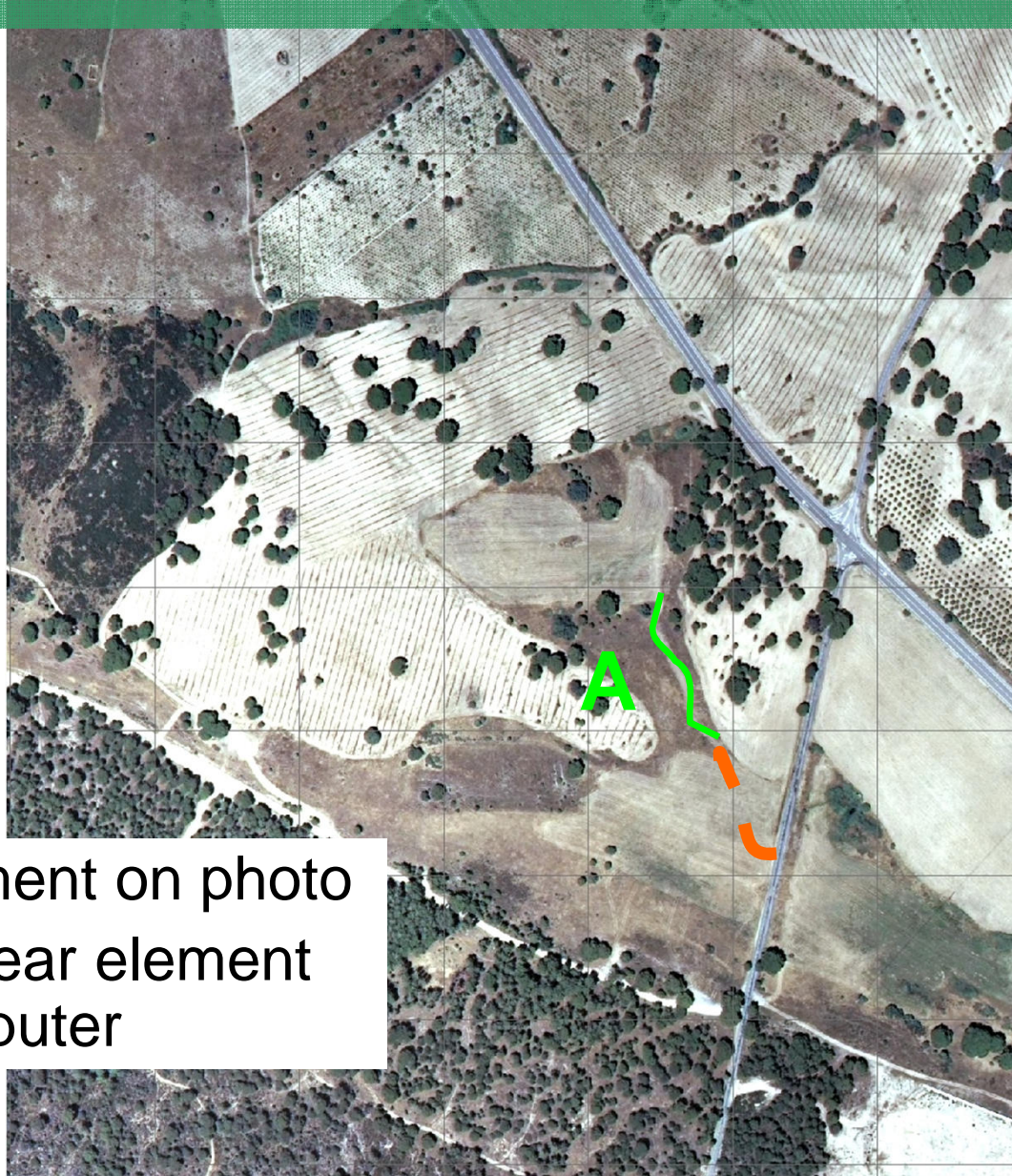
Element is smaller than 400m<sup>2</sup>, longer than 30 m and between 0.5 and 5 m in width = **Linear element (track)**

Take the photomap for the linear elements





## *Walking the grid: 6. Linear elements*



Label the element on photo  
Record the linear element  
on the computer

# Recording linear elements

Always record (even if < 0.5m in width):

Walls and watercourses

<b>α-code</b>	<b>Linear element</b>	<b>Width</b>
A	SRH/MPH/DEC	1

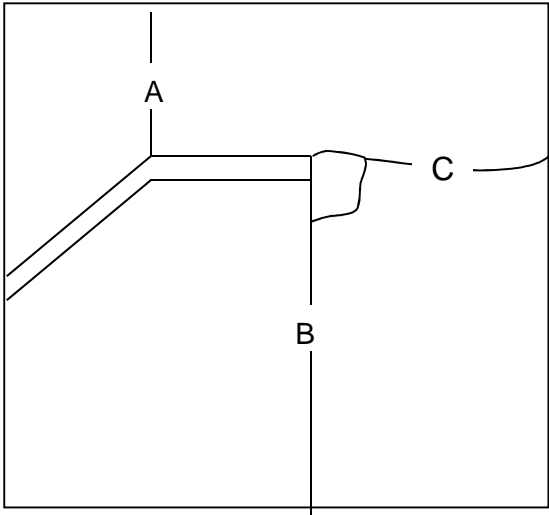


Species rich hedges: 5 or more species per 30m.

GHC strongly recommended

<b>Walls</b>	<b>WAL</b>
<b>Watercourses/Waterbodies</b>	<b>WAT</b>
<b>Lines of scrub + GHC</b>	<b>LSC</b>
<b>Hedges + GHC</b>	<b>HED</b>
<b>Species Rich Hedges + GHC</b>	<b>SRH</b>
<b>Lines of trees + GHC</b>	<b>LTR</b>
<b>Herbaceous strips + GHC</b>	<b>HST</b>
<b>Grass strips + GHC</b>	<b>GST</b>
<b>Annual strips</b>	<b>ANN</b>
<b>Bank</b>	<b>BAN</b>
<b>Tracks</b>	<b>TRA</b>
<b>Roads</b>	<b>ROA</b>
<b>Lines of SPV</b>	<b>LSV</b>

# Example of mapping and recording of linear features

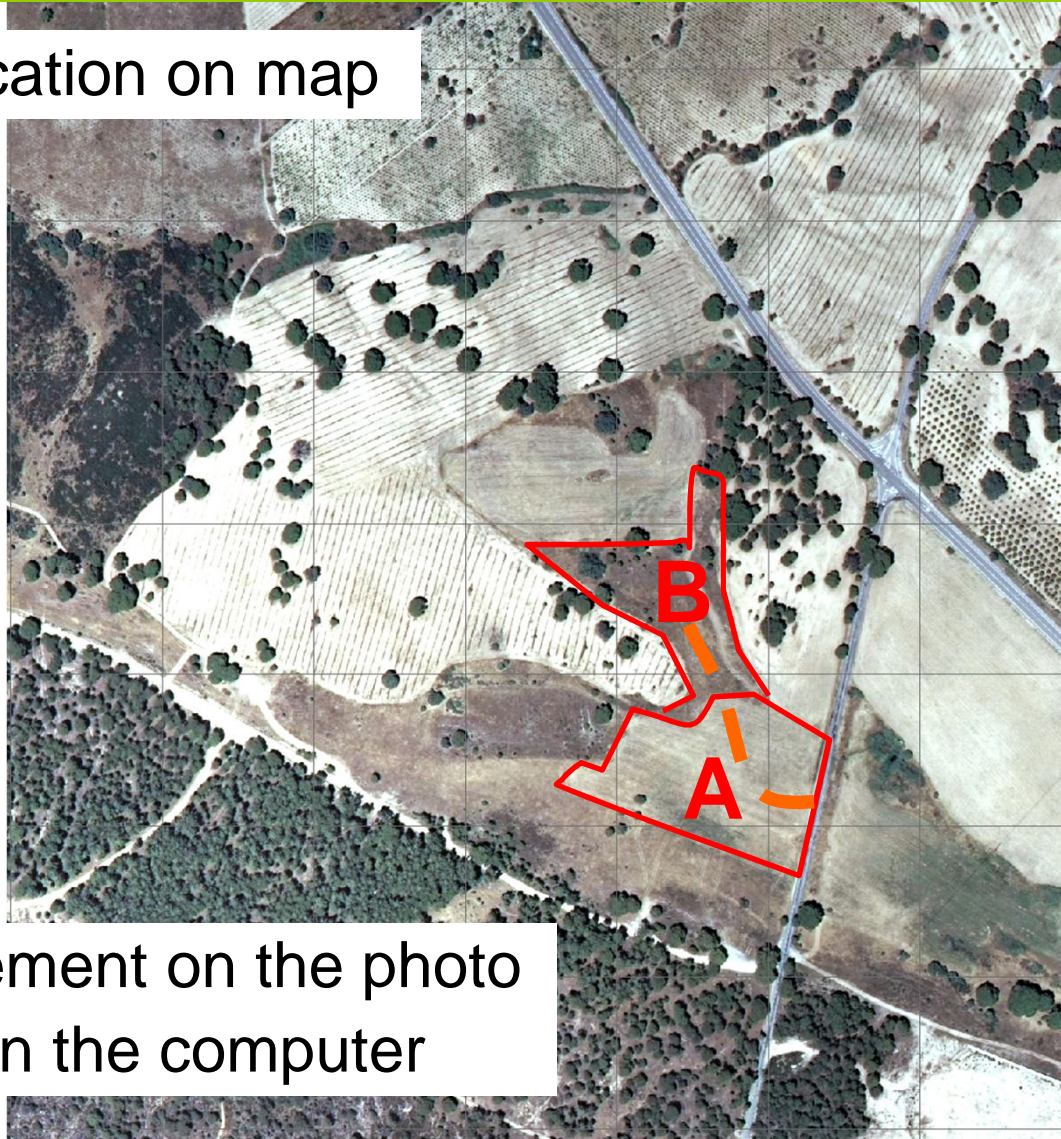


<b>α code</b>	<b>Linear element</b>
A	HED/MPH/DEC
B	HST/LHE/CHE
C	LTR/FPH/DEC



# *Walking the grid: 4. Areal elements*

Draw location on map



Label the element on the photo  
and record on the computer

# When is a patch a new element

Elements are recorded separate if any one of the following rules is true:

- A change in General Habitat Category (GHC).
- A change in environmental qualifier.
- A change in site qualifier.
- A change in the occurrence of point elements.
- A change in management qualifier.
- A change of **at least 30% in the cover** of an individual species of the top layer
- A change in any other specified habitat, especially the habitats of Annex I of the Habitats Directive.



## *Walking the grid: 4. Areal elements*





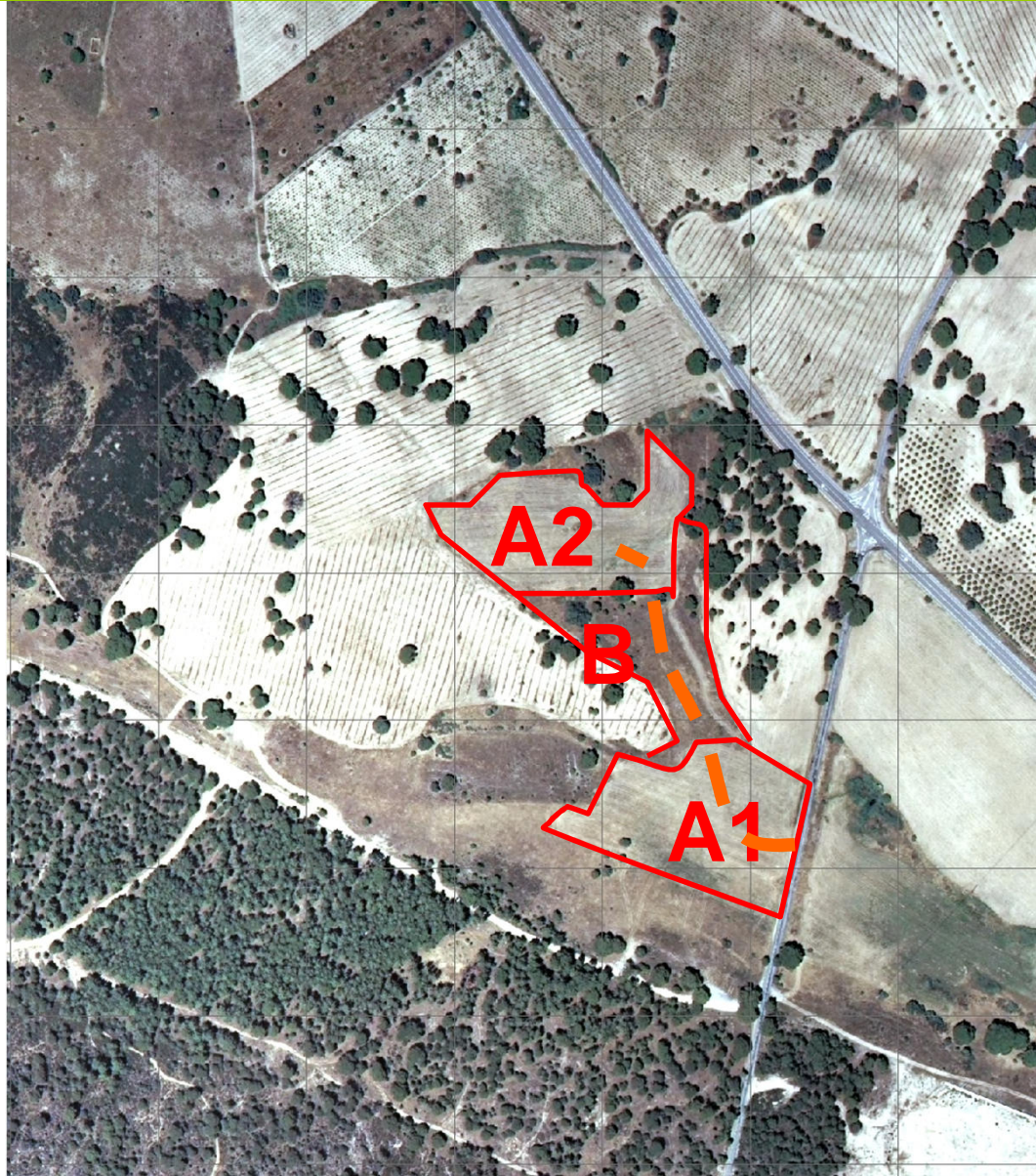
# Habitat recording

Example recording sheet: AREAL ELEMENTS										
AREAL	Field 1	Field 2	Field 3	Field 4	Field 5					
Code	General Habitat Category	Global Env. Qualifier	Site Qualifier	Management qualifier	Full list of Habitats	%	Species	%	Annex I	Farmland class
A	CRO	SCA	3.12	A 1.1.1/2	CRO	100	Wheat	60	0	1
							Barley	40		
B	LHE/CHE	5.3	1.18	A 1.8	LHE	60	Chr leu	10	6520	1
							San off	10		
					CHE	40	Agr cap	50		

It's the same as the other wheat field, A,  
so no new recording has to be made and no  
new letter has to be allocated.

When using a field computer this will be A2,  
so all polygons get a unique alpha code

# *Walking the grid: 4. Areal elements*



# Point elements

- A GHC with an area below 400 m<sup>2</sup> and below 30m length that has *significance in a landscape ecological perspective*:
  - ***Contributes to biodiversity***
  - ***Effects ecological function***
- Record with an  $\triangle$  and a label on the map and describe on the linear recording sheet