Biodiversity –

Recognizing and Assessing Diversity

Plant and Vegetation Science, Identification Exercises

In the following hours, you will learn:

Identify unknown plant/animal species Classify plants/animals taxonomically Identify plants/animals using a scientific or popular science identification book Describe important plant characteristics using our questionnaires Describe site characteristics using our questionnaires Why Learn About Plants? Ecological field investigations usually begin with the description of a site. This includes abiotic factors (light exposure, orientation, geological substrate, water balance, etc.). Since practically no vegetation-free sites exist in Central Europe, the characterization of vegetation is also essential. Usually, a brief description like "meadow," "forest," "roadside," or "swamp" is insufficient because each of these site types has various variants, often differing significantly in their plant composition. Therefore, a list of the plants found at the site is much more informative. The plant species must be determined precisely, at least to the species level, often to the subspecies level. Plant experts can immediately infer site characteristics from such a plant list:

Flower of the Fly Orchid (Ophrys insectifera), Pasqueflower (Pulsatilla vulgaris), and Round-headed Rampion (Phyteuma orbiculare) are characteristic of calcareous grasslands. Narrow-leaved Cotton-grass (Eriophorum angustifolium), Bog Asphodel (Narthecium ossifragum), and Cranberry (Vaccinium oxycoccus) are found only in acidic bogs along with Sphagnum moss. If you find Stinging Nettle (Urtica dioica), Cleavers (Galium aparine), and Rough Chervil (Chaerophyllum temulum), you can conclude that it's a nitrogen-rich site (e.g., road edges). By summarizing numerous tables and sorting them by their species composition, vegetation scientists can precisely characterize plant communities. Often, similar vegetation types (grasslands, forests) may differ significantly in their composition at first glance. For zoologically-oriented ecologists, vegetation is also of interest because animals are strongly tied to site types.

Determination In addition to numerous identification literature in text and images, the internet can also be helpful. Among several websites, "Krautfinder" (https://www.pflanzen-bestimmung.de/) seemed to be the simplest and reliable in terms of results. However, there may still be errors, so it's advisable to cross-check

the results with other identification sources. You can use this website to pre-identify your findings. There are other websites available, but they are usually of lesser scope and less practical, which is a matter of personal preference.

In recent years, automatic pattern recognition has developed rapidly. In this context, mobile apps have been developed to help identify plant species. Examples include:

Flora Incognita: https://floraincognita.com/de/apps/; developed by German scientists; you can create databases with your own observations. Pl@ntNet: https://plantnet.org/en/; developed by French scientists, with extensive datasets, applicable worldwide. iNaturalist: https://www.inaturalist.org/; this program comes from the United States and is not limited to plants.

Tasks

Determine 10 species each (be careful not to have duplicates in the group's work!). Animals are more challenging to capture than plants. A ratio of 7:3 (plants to animals) is useful but not necessary. Document each identified species with a photo, which you attach to the back of the data sheet (or put it together in a clear plastic sleeve). Research interesting information about each species and compile the information on the data sheet. Note any additional information (stories) on the back. Submit your work at the beginning of the school year (End of Module grade!).

Data Sheet - Please fill out separately for each plant/animal.

Scientific Plant Name

Common Plant Name

Description of the Flower

Description of the Leaves

Location (Meadow, Forest Edge...)

Light Conditions

Soil Conditions

Growth Form

How does the plant propagate? (Berries - Animals, Wind - Seeds)

Odor (Flowers, Leaves, possibly by rubbing)

Herbaceous or Woody

Indicator Species

Is the plant poisonous, edible, or a medicinal plant?

Is the plant native or a neophyte? (Where does the plant come from?)

Is the plant common, rare, protected?

When does the plant bloom? Timeframe

What are the possible pollinators?

Additional Information Ellenberg Indicator Values (Excerpts, source below; sometimes modified) This work compiles ecological indicator values according to Ellenberg et al. 2001 (Higher Plants), Düll (Mosses), and Wirth (Lichens) for all plant species found in Central Europe. The ecological behavior concerning a specific site factor is typically expressed by a digit from 1 to 9. A 0 is only used for the salt factor, indicating very low tolerance.

The indicator values reflect the occurrence of a group of species in the gradient of environmental factors under field conditions, i.e., in the presence of strong interspecific competition. The indicator values do not provide information about the "requirements" or behavior in monoculture. For vascular plants, there are always two groups of indicator values: first, three, and then four (or five) columns of digits:

Light number (L) Heat number (T) Continental number (K) Moisture number (F) Reaction number (R) Nitrogen number (N) Salt number (S) Mosses lack the nitrogen and salt numbers, so the second group only includes two values. For lichens, there are two sets of three values, followed by a column for the substrate.

Here is an excerpt from "Ellenberg Indicator Values" according to Ellenberg, 2001:

The "Ellenberg Indicator Values" are freely accessible through the following link: http://www.utb-shop.de/downloads/dl/file/id/27/zusatzkapitel_zeigerwerte_der_pflanzen_mitteleuropas.pdf