Microhabitat assessment protocol

The protocol is based on observational indicators used in forest ecology and biodiversity monitoring, adapted for citizen science to allow reliable recording without specialised equipment.

20' (average time to complete activity)

Introduction

Old and living trees often contain small structures that provide shelter, food, or breeding places for many organisms. These structures, known as **tree microhabitats**, include cavities, cracks, loose bark, fungal growth, dead branches, and other natural features that develop over time. They are essential for forest biodiversity, because many insects, birds, bats, fungi, and lichens depend on them.
The presence of microhabitats can also give information about the age, history, and ecological quality of a forest stand. Forests with a high diversity of microhabitats usually support a greater variety of species and show signs of natural development.
This protocol guides the observation of microhabitats on a single tree. In order to recognise different types of structures and to record their presence in a simple and consistent way.

When & Where to do it

The observation can be carried out in any forest location and season. It works best on mature trees, but younger trees can also show some microhabitats.
Choose a tree that draws your attention, and which can be clearly observed from the ground. You may use the same tree selected in the tree assessment protocol.
Its crown, trunk, and surrounding area should be visible.

Safety note

Prior to commencing the assessment, carefully observe and assess the tree and its surroundings for any risks, such as hanging branches or precarious trees.
Always make sure to avoid trees that you cannot safely approach and be mindful of risks around you.

What you need

mobile phone with the app
notebook (optional)
camera (optional)

Hint: Move slowly around the tree and observe carefully.
Many microhabitats are small and easy to miss.

Step-by-step observation

Stand at some distance and look at the tree as a whole.
Then walk slowly around the trunk and look from the base to the crown as far as you can see.

Make sure not to damage the tree or remove bark, moss, or fungi.

Types of microhabitats to look for :

Cavities and holes
Openings in the trunk or branches that may be used by birds, insects, or small mammals.
Cracks and splits
Deep fissures in the wood or bark that can provide shelter for insects and fungi.
Loose or peeling bark
Detached bark plates create protected spaces for many small organisms.
Dead branches
Dry or broken branches that remain attached to the tree.
Fungal growth
Mushrooms, brackets, or other fungi growing on the trunk or branches.
These are important for decomposition and nutrient cycling.
Sap runs or wounds
Areas where the bark is damaged or where sap is visible.
Mosses, lichens, and bryophytes
Growth on the bark, especially on older or shaded trees.
Ivy or climbing plants
These may provide habitat for insects and birds.

Indicators to record

Using the app, note the presence of each type of microhabitat.
You do not need to count precisely.
Recording whether a feature is present or absent is enough.
If possible, take a photo.

Data entry in the App

In the app through a sequence of shorts questions and prompts participants observe a tree of their choice in the field.
The mobile application provides icons for different microhabitat types and allows the observation to be recorded directly in the field.

Methodological background

The microhabitat observation protocol is based on approaches developed for the identification of tree- related microhabitats in forest ecology and conservation research.
Tree microhabitats , such as cavities, cracks and loose bark, fungal fruiting bodies, and dead branches provide important habitats for many species and are widely used as indicators of biodiversity.
Their number and variety often increase with tree age, structural diversity, and low disturbance. Because many species depend on these structures, their presence helps scientists understand habitat quality and ecological continuity in forest stands.

Professional surveys use a detailed classification system to record these structures. This protocol simplifies these methods for citizen science and field learning activities, while maintaining a clear link to established ecological practices. Observations made by participants can help document the distribution of microhabitats and support studies on forest biodiversity and management.

Based on the sources:

ANF. Großmann, J. & Carlson, L. 2021. Erfassung biodiversitäts-relevanter Waldstrukturen an Einzelbäumen und Baumgruppen: Methodenleitfaden zur systematischen Erhebung von Baum-Mikrohabitaten und Totholz. Forstliche Versuchs- und Forschungsanstalt Baden-Württemberg. DOI: 10.6094/UNIFR/193828

Castello JD, Teale SA, eds. Forest Health: An Integrated Perspective. Cambridge University Press; 2011.

Kraus, D., Bütler, R., Krumm, F., Lachat, T., Larrieu, L., Mergner, U., Paillet, Y., Rydkvist, T., Schuck, A., Winter, S. (2016).
Catalogue of tree microhabitats – Reference field list.
Integrate+ Technical Paper. European Forest Institute.
Available at:
https://informar.eu/sites/default/files/pdf/Catalogue_Tree-Microhabitats_Reference-Field-List_EN.pdf