

# Humus Types

Three humus types mor, moder, and mull form in upland forests under aerobic conditions. Three humus types sapric, hemic, and fibric form in wetlands under anerobic conditions. The muck humus type forms in wetlands that annually fluctuate between aerobic and anerobic conditions.

## Mor humus

Develops in conifer and/or moss litter that is being decomposed primarily by fungi. A thick mat of undecomposed (L)\* litter is often present with a thin or no fermentation (F)\* and humus (H)\* layers. There is very little mixing with the mineral soil. Mor humus is characteristic of the Fire-Dependent Forest/Woodland System.

## Moder humus

Develops in broad-leaved deciduous litter that is being decomposed by bacteria and invertebrates. It often has layers in all stages of decomposition litter (L)\*, fermentation (F)\*, and humus (H)\* layers. There is some mixing of the humus layer and the mineral topsoil. Moder humus is characteristic of the Mesic Hardwood Forest System without worms.

## Mull humus

Develops in broad-leaved deciduous litter that is being decomposed by exotic earthworms. A thin litter (L)\* layer comprised only of plant remains from the previous fall may or may not be present on top of a thick, dark topsoil layer. Well-decomposed organic matter is thoroughly and deeply mixed into the mineral topsoil. Worm castings are usually present on the mineral soil surface. Wormed-mull humus is typically found in the Mesic Hardwood Forest System. Mull humus classically develops in Prairies and Open Wetlands Systems where grasses and sedges produce copious amounts of roots, that die and rot in place to create organic-rich topsoil that may be several feet thick.

## Muck humus

Develops in broad-leaved deciduous and moss litter although some coniferous litter may also be present. It typically forms in wetlands where the hydrologic regime annually fluctuates between aerobic and anaerobic conditions. A thin litter (L)\* layer is present on top of a thick highly-decomposed organic (H)\* layer. Muck humus is physically and chemically distinct from the humus of upland communities in its ability to absorb water, adsorb metals toxic to plants, and release nutrients. Muck contains more mineral matter, is darker in color than peat. Muck humus is characteristic of the Wet Forest System.

### **\* Footnote:**

L, F, H are organic horizons with differing degrees of decomposition. They develop primarily from the accumulation of leaves, needles, twigs, and woody materials with or without a minor component of mosses. They are usually not saturated for prolonged periods.

L (litter): original vegetation structures (leaves, needles, twigs, etc) are easily discernible.

F (fermentation): some of the original structures are difficult to recognize.

H (humus): the original structures are indiscernible.

Three peat humus types sapric, hemic, and fibric form in wetlands with continuous water saturation. Organic matter (peat) accumulates because anaerobic conditions and low temperatures prevent decomposition.

#### Sapric Peat

The most decomposed class of peat characterized by less than 1/3 recognizable plant fibers.

#### Hemic peat

A moderately decomposed class of peat characterized by 1/3 to 2/3 recognizable plant fibers. The source of organic matter is mosses, sedges, or grasses.

#### Fibric peat

The least decomposed class of peat characterized by more than 2/3 recognizable plant fibers. The source of organic matter is sphagnum moss and woody plant debris.

Adapted from:

Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province. Minnesota Department of Natural Resources, 2003 and Field Manual for Describing Soils; Ontario Institute of Pedology, 1985.

