Field Indicators of Hydric Soils in the United States, Version 8.2 (2018)
Indicators for use in LRR R

WETLAND INTERIOR INDICATORS

ALL SOILS

A1. Histosol

Classifies as a Histosol (except Folist) or as a Histel (except Folistel).

A2. Histic Epipedon.

A histic epipedon underlain by mineral soil material with chroma of ≤ 2.

A3. Black Histic.

A layer of peat, mucky peat, or muck ≥ 20cm (8in) thick that starts at a depth of ≤ 15cm (6 in) from the soil surface; has hue of 10YR or yellower, value of ≤ 3, and chroma of ≤1; and underlain by mineral soil material w/chroma of ≤ 2.

A4. Hydrogen Sulfide.

A hydrogen sulfide odor starting at a depth ≤ 30cm (12 in) of the soil surface. ("rotten egg" smell)

A12. Thick Dark Surface.

A layer at least 15 cm (6 in) thick w/a depleted or gleyed matrix that has ≥ 60% chroma ≤ 2 starting below 30 cm (12 in) of the surface. The layer(s) above the depleted or gleyed matrix and starting at a depth < 15 cm (6 in) from the soil surface must have value of ≤ 2.5 and chroma of ≤ 1 to a depth of at least 30 cm (12 in) and value of ≤ 3 and chroma of ≤ 1 in any remaining layers above the depleted or gleyed matrix. In any sandy material above the depleted or gleyed matrix, at least 70% of the visible soil particles must be masked with organic material, viewed thru a 10x or 15x hand lens. Observed without a hand lens, the particles appear to be close to 100% masked.

SANDY SOILS

S1. Sandy Mucky Mineral.

A layer of mucky modified sandy soil material ≥ 5 cm (2 in) thick starting at a depth ≤15 cm (6 in) from the soil surface.

S4. Sandy Gleyed Matrix.

A gleyed matrix that occupies ≥ 60% of a layer starting at a depth ≤15 cm (6 in) from the soil surface.

S8. Polyvalue Below Surface.

A layer with value ≤ 3 and chroma ≤ 1 starting at a depth ≤15cm (6 in) from the soil surface. At least 70% of the visible soil particles must be masked with organic material, viewed thru a 10x or 15x hand lens. Observed w/o a hand lens, the particles appear to be close to 100% masked. Directly below this layer, ≥ 5% of the soil volume has value of ≤ 3 and chroma of ≤ 1,and the remainder of the soil volume has value of ≥ 4 and chroma of ≤ 1 to a depth of 30 cm (12 in) or to the spodic horizon, whichever is less.

LOAMY AND CLAYEY SOILS

F2. Loamy Gleyed Matrix.

A gleyed matrix that occupies ≥ 60% of a layer starting at a depth ≤ 30cm (12 in) from the soil surface

PROCEDURE

Where to begin looking. Start observations at the actual surface for indicators A1, A2, and A3; start observations at the muck or mineral surface for A11 and A12 and for testing indicators that allow muck; and start observations at the mineral surface for all other indicators.

IMPORTANT DEFINITIONS

Hydric soil definition (1994). A soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

Layer(s). A horizon, subhorizon, or combination of contiguous horizons or subhorizons sharing at least one property referred to in the indicators.

All Soils Refers to soils with any USDA soil texture. All mineral layers above any layers meeting the requirements of any A indicator(s), have a dominant chroma of ≤ 2, or the thickness of the layer(s) with a dominant chroma of >2 is <15 cm (6 in). In addition, nodules and concretions are not considered to be redox concentrations for the application of the indicators. Use A-indicators in all soil layers, regardless of texture.

Sandy Soils Have a USDA texture of loamy fine sand and coarser. All mineral layers above any of the layers meeting the requirements of any S indicator(s), except for indicator S6, have a dominant chroma of < 2, or the thickness of the layer(s) with a dominant chroma of > 2 is < 15 cm (6 in). In addition, nodules and concretions are not considered to be redox concentrations.

Loamy and Clayey Soils Have USDA textures of loamy very fine sand and finer. All mineral layers above any of the layers meeting the requirements of any F-indicator(s), except for indicators F8 and F21, have a dominant chroma of ≤ 2, or the thickness of the layer(s) with a dominant chroma of > 2 is < 15 cm (6 in).

Reduced matrix. A soil matrix that has low chroma and high value, but in which the color changes in hue or chroma when the soil is exposed to air. See Vepraskas (1994) for a complete discussion.

***Gleyed matrix.** Soils with a gleyed matrix have the following combinations of hue, value, and chroma (the soils are not glauconitic):

1. 10Y, 5GY, 10GY, 10G, 5BG, 10BG, 5B, 10B, or 5PB with value of ≥ 4 and chroma of 1; or
2. 5G with value ≥ 4 and chroma of 1 or 2; or
3. N with value of ≥ 4; or

In some places the gleyed matrix may change color upon exposure to air. (See Reduced matrix). This phenomenon is included in the concept of gleyed matrix.

***Depleted matrix.** For loamy and clayey material, (and sandy material in areas of A11 and A12), a depleted matrix refers to the volume of a soil horizon or subhorizon in which the processes of reduction and translocation have removed or transformed iron, creating colors of low chroma and high value. A and E horizons may have low chromas and high values and may therefore be mistaken for a depleted matrix; however, they are excluded from the concept of depleted matrix unless the soil has common or many distinct or prominent redox concentrations occurring as soft masses or pore linings. In some areas the depleted matrix may change color upon exposure to air (see Reduced matrix); this phenomenon is included in the concept of depleted matrix. The following combinations of value and chroma identify a depleted matrix:

1. Matrix value of ≥ 5 and chroma of ≤ 1 with or without redox concentrations occurring as soft masses and/or pore linings; or
2. Matrix value of ≥ 6 and chroma of ≤ 2 with or without redox concentrations occurring as soft masses and/or pore linings; or
3. Matrix value of 4 or 5 and chroma of 2 and ≥ 2% distinct or prominent redox concentrations occurring as soft masses and/or pore linings; or
4. Matrix value of 4 and chroma of 1 and ≥ 2% distinct or prominent redox concentrations occurring as soft masses and/or pore linings.

***Mucky modified mineral soil material.** A USDA soil texture modifier, e.g., mucky sand. Mucky modified mineral soil material that has 0% clay has between 5 and 12% organic carbon. Mucky modified mineral soil material that has 60% clay has between 12 and 18% organic carbon. Soils with an intermediate amount of clay have an intermediate amount of organic carbon. Where the organic component is peat (fibric material) or mucky peat (hemic material), mucky mineral soil material does not occur.

For complete Indicators and User Notes go to:
www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053171.pdf

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ALL SOILS

A5. Stratified Layers. Several stratified layers starting at ≤15cm (6 in) from the soil surface. At least one of the layers has value of ≤ 3 and chroma of ≤ 1,or it is muck, mucky peat, peat, or a mucky modified mineral texture. The remaining layers have chroma of ≤ 2. For any sandy material that constitutes the layer with value of ≤ 3 and chroma of ≤ 1, at least 70% of the visible soil particles must be masked with organic material, viewed thru a 10x or 15x hand lens. Observed without a hand lens, particles appear to be close to 100% masked.

A11. Depleted Below Dark Surface. A layer with a depleted or gleyed matrix that has ≥ 60% chroma of ≤ 2, starting at a depth ≤30 cm (12 in) from the soil surface, and having a minimum thickness of either:

a. 15 cm (6 inches), or
b. 5 cm (2 in) if the 5 cm consists of fragmental soil material.

Organic, loamy, or clayey layer(s) above the depleted matrix must have value of ≤ 3 and chroma of ≤ 2 starting at a depth <15cm (6 in) from the soil surface and extend to the depleted or gleyed matrix. Any sandy material above the depleted or gleyed matrix must have value of ≤ 3 and chroma of ≤ 1 starting at a depth ≤15 cm (6 in) from the soil surface and extend to the depleted or gleyed matrix. Viewed thru a 10x or 15x hand lens, at least 70% of the visible sand particles must be masked w/organic material. Observed without a hand lens, the sand particles appear to be close to 100% masked.

A17. Mesic Spodic. For use in MLRAs 144A and 145. A layer that is ≥ 5 cm (2 in) thick, that starts at a depth ≤ 15 cm (6 in) from the mineral soil surface, that has value of ≤ 3 and chroma of ≤ 2 and that is directly underlain by either:

a. One or more layers of spodic material that have a combined thickness ≥ 8 cm (3 in) that starts at a depth ≤ 30 cm (12 in) from the mineral soil surface, and that have a value and chroma of ≤ 3; or

b. One or more layers that have a combined thickness of ≥ 5 cm (2 in), that start at a depth ≤30 cm (12 in) from the mineral soil surface, that have a value of ≥ 4 and chroma of ≤ 2, and that are directly underlain by ≥ 1 layers that have a combined thickness of ≥ 8 cm (3 in), that are spodic materials, and that have a value and chroma of ≤ 3."

SANDY SOILS

S5. Sandy Redox. A layer starting at a depth ≤15 cm (6 in) from the soil surface that is at least 10 cm (4in) thick and has a matrix with ≥ 60% chroma of ≤ 2 and ≥ 2% distinct or prominent redox concentrations occurring as soft masses and/or pore linings.

S6. Stripped Matrix. A layer starting at a depth ≤15cm (6 in) from the soil surface in which iron-manganese oxides and/or organic matter have been stripped from the matrix and the primary base color of the soil material has been exposed. The stripped areas and translocated (continued) oxides and/or organic matter form a faintly contrasting pattern of two or more colors with diffuse boundaries. The stripped zones are ≥ 10% of the volume and are rounded.

WETLAND BORDER INDICATORS

S7. Dark Surface. A layer 10 cm (4 in) thick, starting at a depth ≤ the upper 15 cm (6 in) from the soil surface, with a matrix value ≤ 3 and chroma of ≤ 1. At least 70% of the visible soil particles must be masked with organic material, viewed thru a 10x or 15x hand lens. Observed without a hand lens, particles appear to be close to 100% masked. The matrix color of the layer directly below the dark layer must have the same colors as those described above or any color that has chroma of ≤ 2.

S9. Thin Dark Surface. A layer ≥ 5 cm (2 in) thick, starting at a depth ≤15 cm (6 in) from the soil surface, with value of ≤ 3 and chroma of ≤ 1. At least 70% of the visible soil particles must be masked with organic material, viewed thru a 10x or 15x hand lens. Observed without a hand lens, the particles appear to be close to 100% masked. This layer is underlain by a layer or layers with value of ≤ 4 and chroma of ≤ 1 to a depth of 30 cm (12 in) or to the spodic horizon, whichever is less.

LOAMY AND CLAYEY SOILS

F3. Depleted Matrix. A layer that has a depleted matrix with ≥ 60% chroma of ≤ 2 and that has a minimum thickness of either:

a. 5 cm (2in) if the 5 cm starts at a depth ≤10 cm (4 in) from the soil surface, or
b. 15 cm (6 in), starting at a depth ≤ 25 cm (10 in) from the soil surface.

F6. Redox Dark Surface. A layer that is at least 10 cm (4 in) thick, starting at a depth ≤ 20 cm (8 in) from the mineral soil surface, and has:

a. Matrix value of ≤ 3 and chroma of ≤ 1 and ≥ 2% distinct or prominent redox concentrations occurring as soft masses or pore linings, or
b. Matrix value of ≤ 3 and chroma of ≤ 2 and ≥ 5 % distinct or prominent redox concentrations occurring as soft masses or pore linings.

F7. Depleted Dark Surface.
Redox depletions with value of ≥ 5 and chroma of ≤ 2 in a layer that is at least 10 cm (4 in) thick, starting at a depth ≤ 20 cm (8 in) from the mineral soil surface, and has:

a. Matrix value of ≤ 3 and chroma of ≤ 1 or and 10% or more redox depletions, or
b. Matrix value of 3 or less and chroma of ≤ 2 and ≥ 20% redox depletions.

F8. Redox Depressions In closed depressions subject to ponding, ≥ 5% distinct or prominent redox concentrations occurring as soft masses or pore linings in a layer that is ≥ 5cm (2 in) thick and starts at a depth ≤10 cm (4 in) from the soil surface.

F21. Red Parent Material (For use in MLRA 145 of LRR R)
A layer derived from red parent materials that is ≥ 10 cm (4 in) thick, starting at a depth ≤ 25 cm (10 In) from the soil surface with a hue of 7.5YR or redder. The matrix has a value and chroma > 2 and ≤ 4. The layer must contain ≥ 10% depletions and/or distinct or prominent concentrations occurring as soft masses or pore linings. Redox depletions should differ in color by having:

a. A minimum difference of one value higher and one chroma lower than the matrix, or
b. Value of ≥ 4 and chroma of ≤ 2

Test Indicators of Hydric Soils in LRR "R"

S3. 5 cm Mucky Peat or Peat. A layer of mucky peat or peat ≥ 5 cm (2 in) thick with value of ≤ 3 and chroma of ≤ 2, starting at a depth ≤15cm (6 in) from the soil surface, and underlain by sandy soil material.

F12. Iron-Manganese Masses. On flood plains, a layer ≥ 10 cm (4 in) thick with ≥ 40% chroma of ≤ 2 and ≥ 2% distinct or prominent redox concentrations occurring as soft iron-manganese masses with diffuse boundaries. The layer starts at a depth ≤ 20 cm (8 in) from the soil surface. Iron-manganese masses have value and chroma of ≤ 3. Most commonly, they are black. The thickness requirement is waived if the layer is the mineral surface layer.

F22. Very Shallow Dark Surface. In depressions and flood plains subject to frequent ponding and/or flooding, one of the following must be observed:

a. If bedrock occurs between 15cm (6 in) and 25cm (10 in) of the soil surface, a layer ≥ 15 cm (6 in) thick starting at a depth ≤10 cm (4 in) from the soil surface with value ≤ 2.5 and chroma ≤ 1, and the remaining soil to bedrock must have the same colors as above or any other color that has chroma ≤ 2. Or,
b. If bedrock occurs at a depth ≤15 cm (6 in) from the soil surface, more than half of the soil thickness must have value ≤ 2.5 and chroma ≤ 1, and the remaining soil to bedrock must have same color as above or any other color that has a chroma ≤ 2.

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