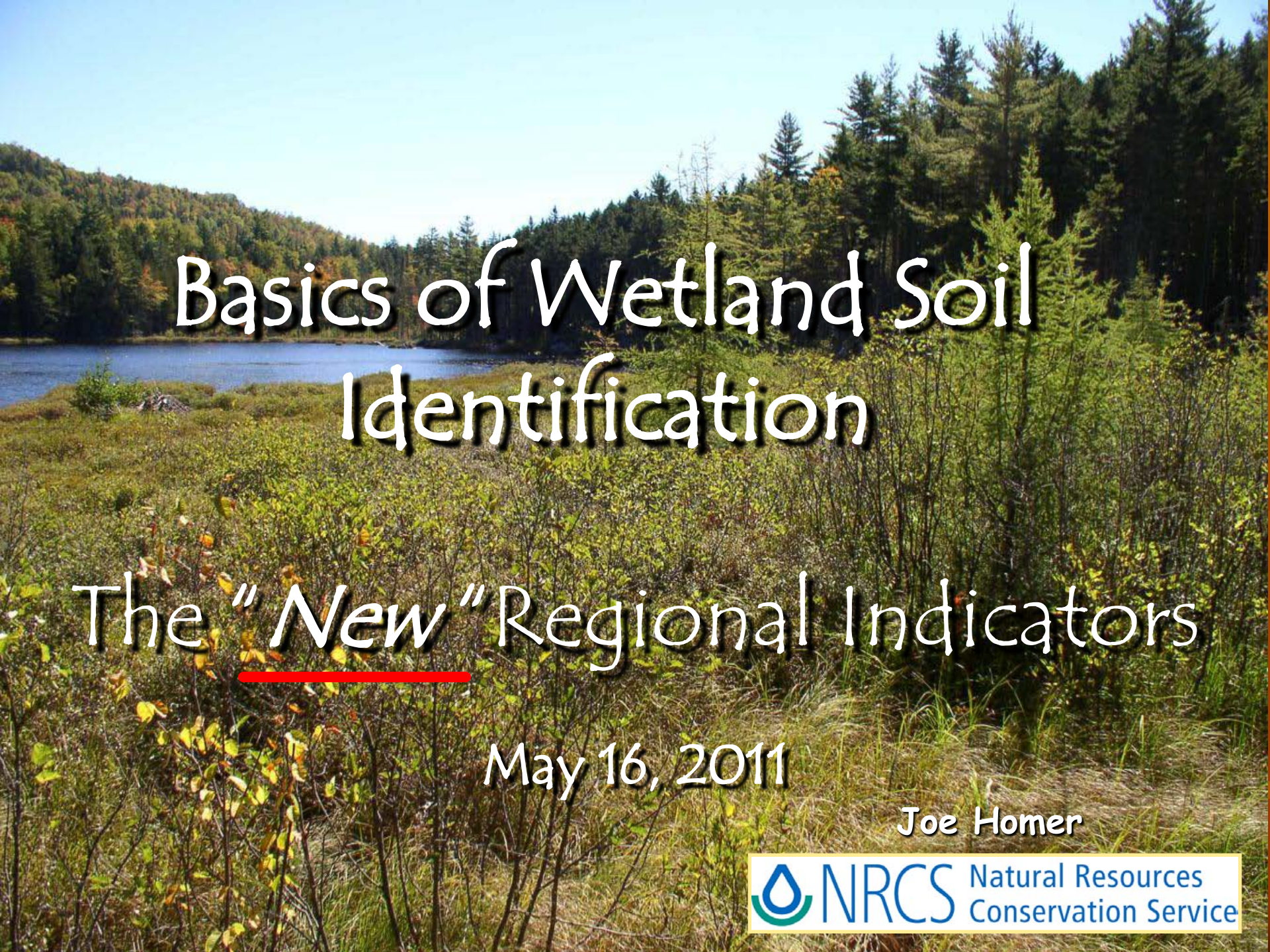


Basics of Wetland Soil Identification

The "*New*" Regional Indicators

May 16, 2011

Joe Homer

NRCS Natural Resources Conservation Service

Times Have Changed

Are You Sure This Is A Hydric Soil?

New England's Hydric Soils

The distribution of hydric soils in the individual New England states is presented in Table 3. Some states have very significant acreages of hydric soils, and on average about 16% of the total soil resource in New England qualifies as hydric. The estimate of hydric soils includes drained soils which are not considered wetland. The present extent of wetland, therefore, is considerably less than is indicated in Table 3. The U.S. Fish and Wildlife Service's National Wetlands Inventory Project is in the process of determining just how much wetland remains in each of the New England states.

General information about the distribution of individual hydric soils in a particular area can be obtained from soil survey reports published by the U.S. Department of Agriculture - Soil Conservation Service in cooperation with various state and federal agencies. These publications provide a spatial inventory of the distribution of soils throughout the landscape but do not specifically identify hydric soils. For that reason, all hydric soil series currently recognized in the New England region, along with their key characteristics and their distribution in individual states, are listed in Appendix I of this document. The listing is subject to continuous revision and up-to-date listings can be obtained from the U.S.D.A. - Soil Conservation Service.

You should also realize that the soil survey reports in this region are produced at a scale between 1:15,840 and 1:25,000 and have certain limitations for use in wetland identification. For example, at this scale, the inventory is seldom site-specific enough for detailed planning; for such purposes, a determination of the exact wetland boundaries should be made in the field. Recognition of more or less continuously waterlogged soils as hydric often is not difficult, even for the layperson. Determination of the hydric character of those soils that are not saturated with water on a

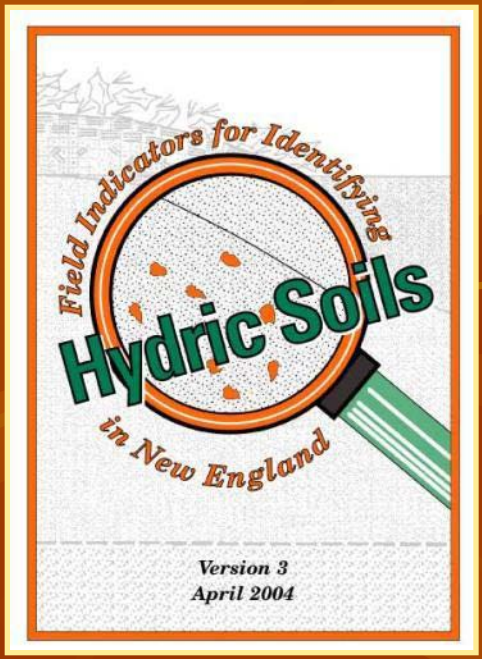
Table 3. Estimated area of hydric suborders by state (adapted from Cunningham and Ciolkosz, 1984). These figures include both drained and undrained hydric soils; therefore, the actual wetland acreage in individual states is substantially less. Suborder terminology is defined in the glossary.

	New Hampshire			Maine			Vermont		
Suborders	hectares x1000	acres x1000	percent of state	hectares x1000	acres x1000	percent of state	hectares x1000	acres x1000	percent of state
Aquents	7	18	0.3	51	126	0.6	13	32	0.6
Aquepts	279	690	12.0	1890	4670	23.5	391	966	17.1
Aquods	38	95	1.7	334	825	4.2	62	153	2.7
Aqualfs	-	-	-	-	-	-	71	175	3.1
Fluvents	13	32	0.6	12	29	0.2	10	24	0.4
Fibrists	0.4	1	>0.1	99	245	1.2	-	-	-
Saprists	-	-	-	111	275	1.4	14	34	0.6
Hemists	59	147	2.6	117	290	1.5	4	11	0.2
Total	396	983	17.2	2,614	6,460	32.6	565	1,395	24.7

Hydric Soil Indicators

So What's Driving this Change?

Continued Use of the NE Indicators ?



- Regulators discussed adding a user note or comment to encourage using the NEIWPCC Hydric Soil Indicators to address problem situations **where the National Indicators and the Regional Supplement may fall short**.
- It was felt that such a comment is not necessary.
- Already, there is sufficient latitude in the language of the supplement to continue using NEIWPCC Indicators and local expertise at problematic sites.
- Wetland Manual, Intro to Chapter 3, Hydric Soil Indicators it acknowledges, **"The list of indicators is dynamic: changes and additions to the list are anticipated with new research and field testing."**
- In the introduction to Chapter 5, Difficult Wetland Situations in the Northcentral and Northeast Region, it cautions, **"In general, wetland determinations on difficult or problematic sites must be based on the best information available to the field inspector, interpreted in light of his or her professional experience and knowledge of the ecology of wetlands in the region."**
- Later in Chapter 5, in step 4 of the procedures, **the value of experience and sound professional judgment** is further amplified.
- Regulatory agencies will continue to rely on the publications and expertise of the New England Hydric Soil Technical Committee to help us address problematic sites.

A Few Basics for using the Hydric Soil Indicators

- The NTCHS defines a hydric soil as, 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.

A Few Basics for using the Hydric Soil Indicators

- Most hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation that last more than a few days.

A Few Basics for using the Hydric Soil Indicators

- Saturation or inundation, combined with microbial activity causes the depletion of oxygen. This promotes certain biogeochemical processes, such as the accumulation of organic matter and the reduction, translocation, or accumulation of iron and other reducible elements.

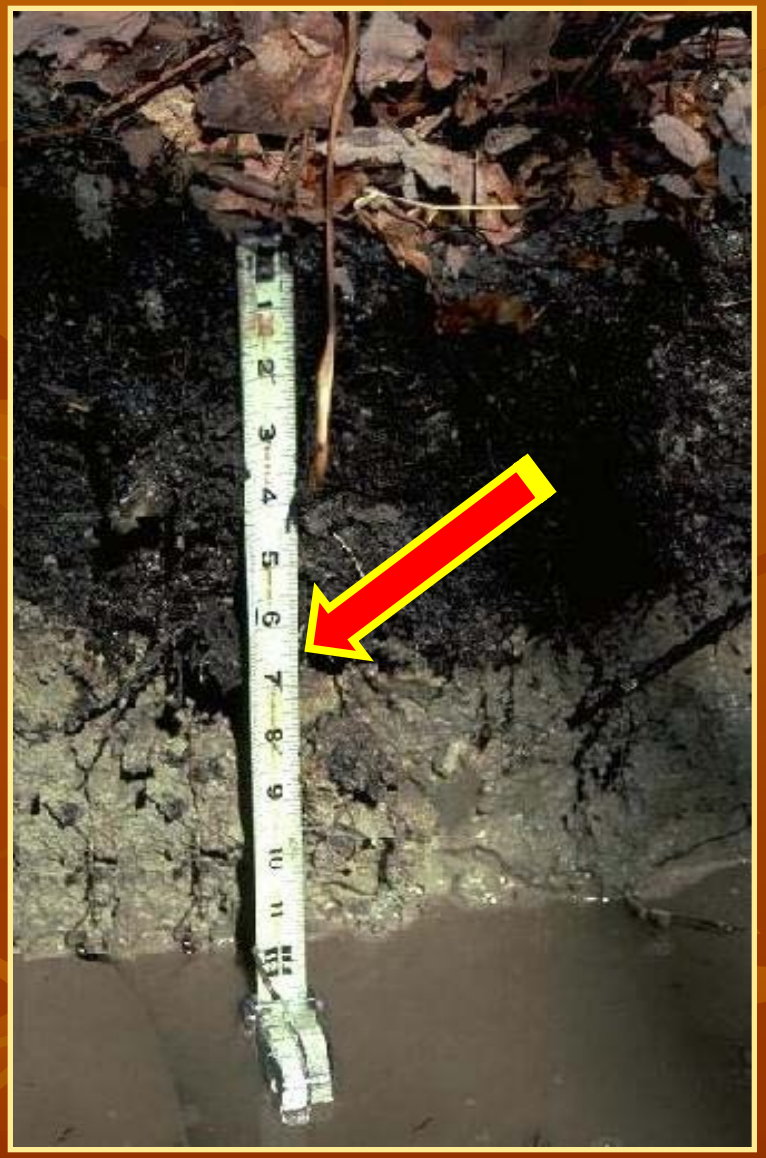
A Few Basics for using the Hydric Soil Indicators

- These processes result in distinctive characteristics that persist in the soil during both wet and dry periods, making them particularly useful for identifying hydric soils in the field.

A Few Basics for using the Hydric Soil Indicators

- Where to begin looking.

Begin observations at the top of the mineral surface (underneath any and all fibric, hemic, and/or sapric material) except for application of indicators A1, A2, A3 and S3 (for Testing in LRR R).



A Few Basics for using the Hydric Soil Indicators

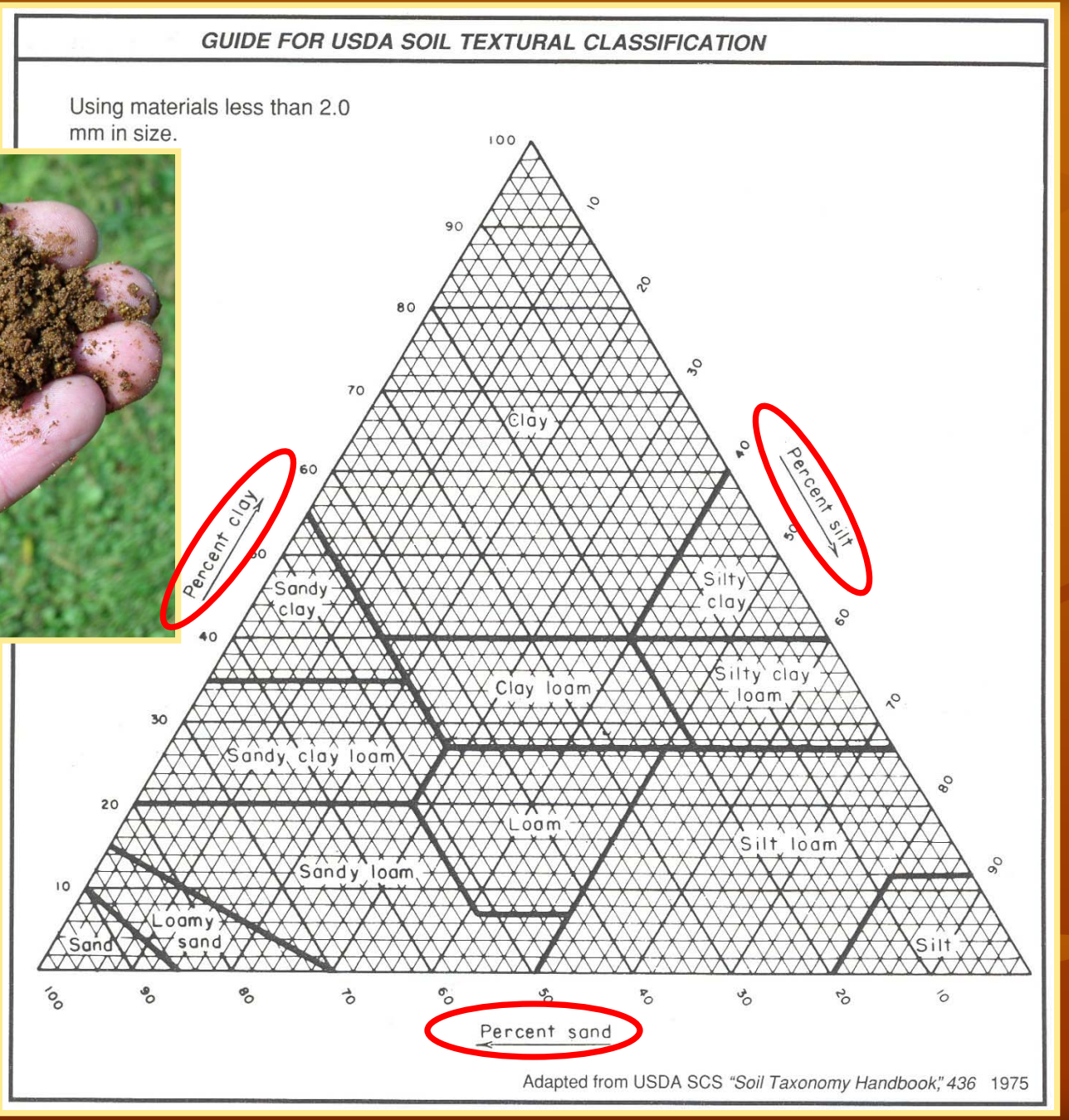
- Where to begin looking.

Begin observations at the top of the mineral surface (underneath any and all fibric, hemic, and/or sapric material) except for application of indicators A1, A2, A3 and S3 (for Testing in LRR R).

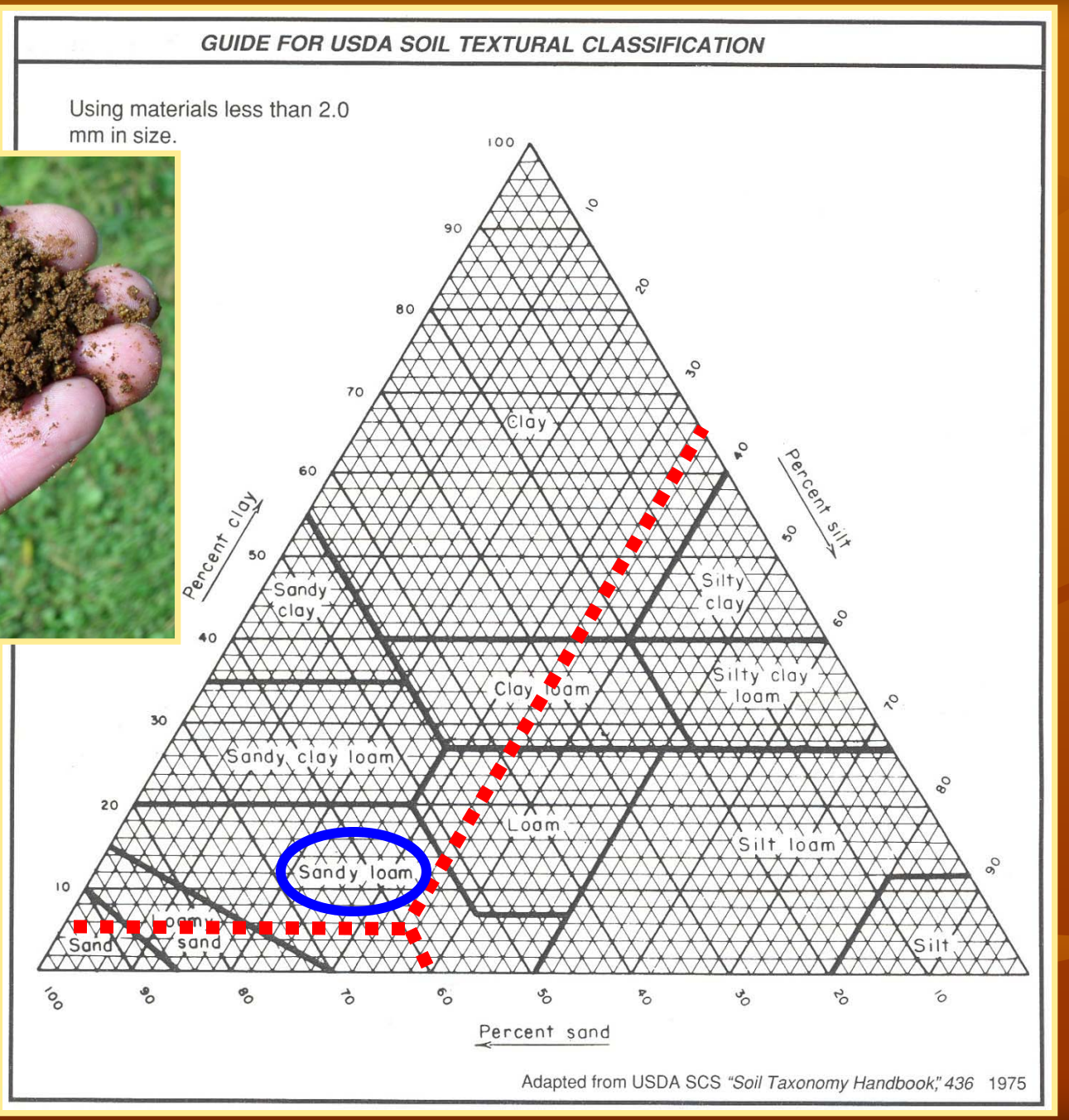
A Few Basics for using the Hydric Soil Indicators

Read the Introduction!

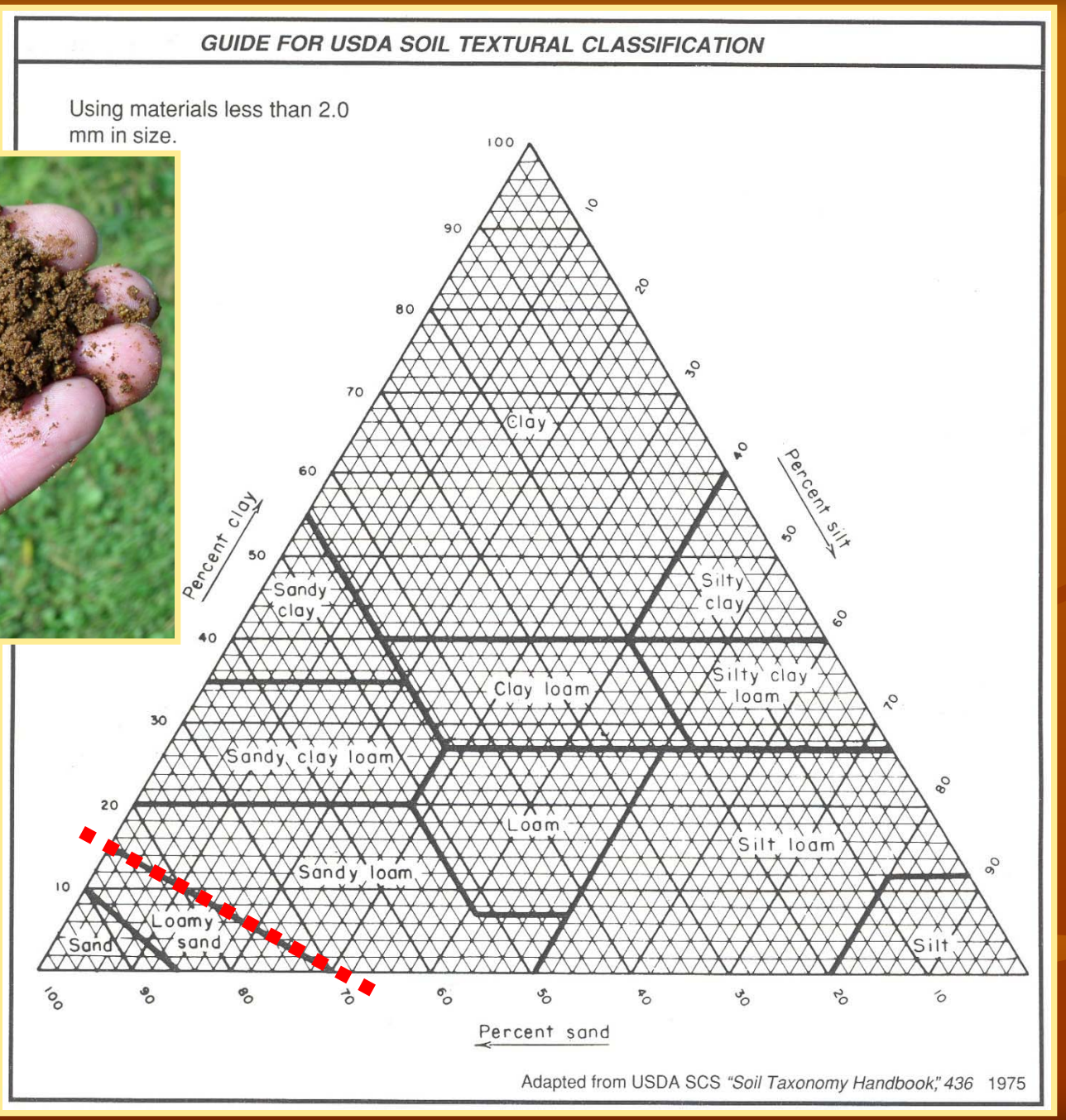
What's the Texture ?



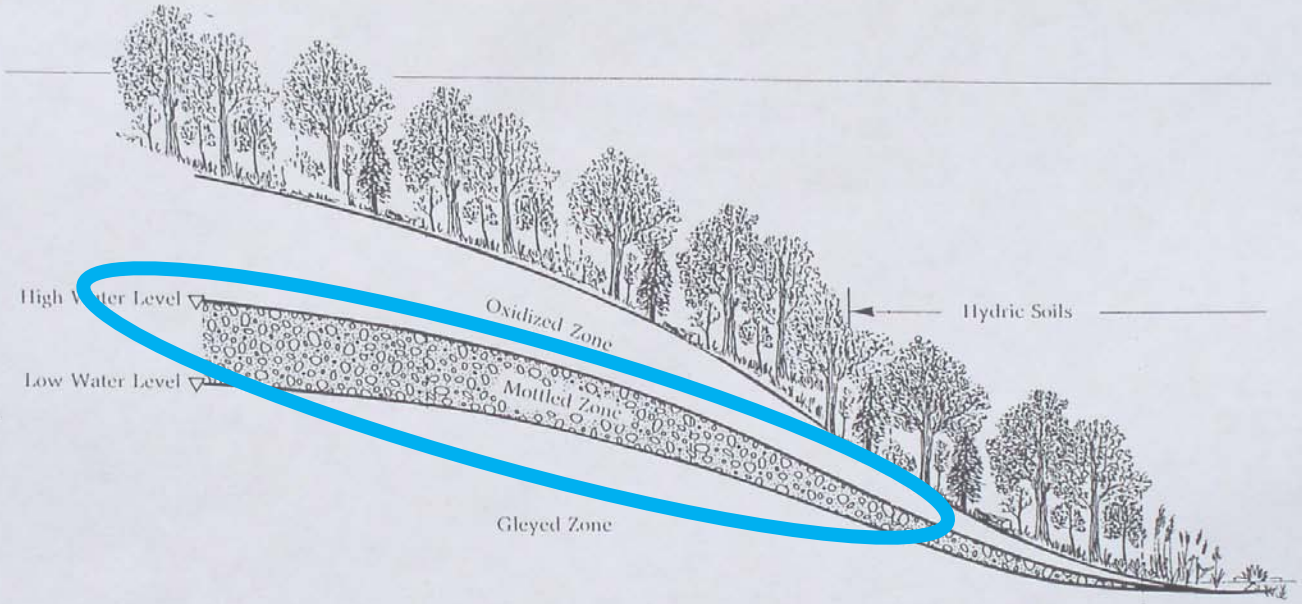
60% Sand
35% Silt
5% Clay



Important for Hydric Indicators

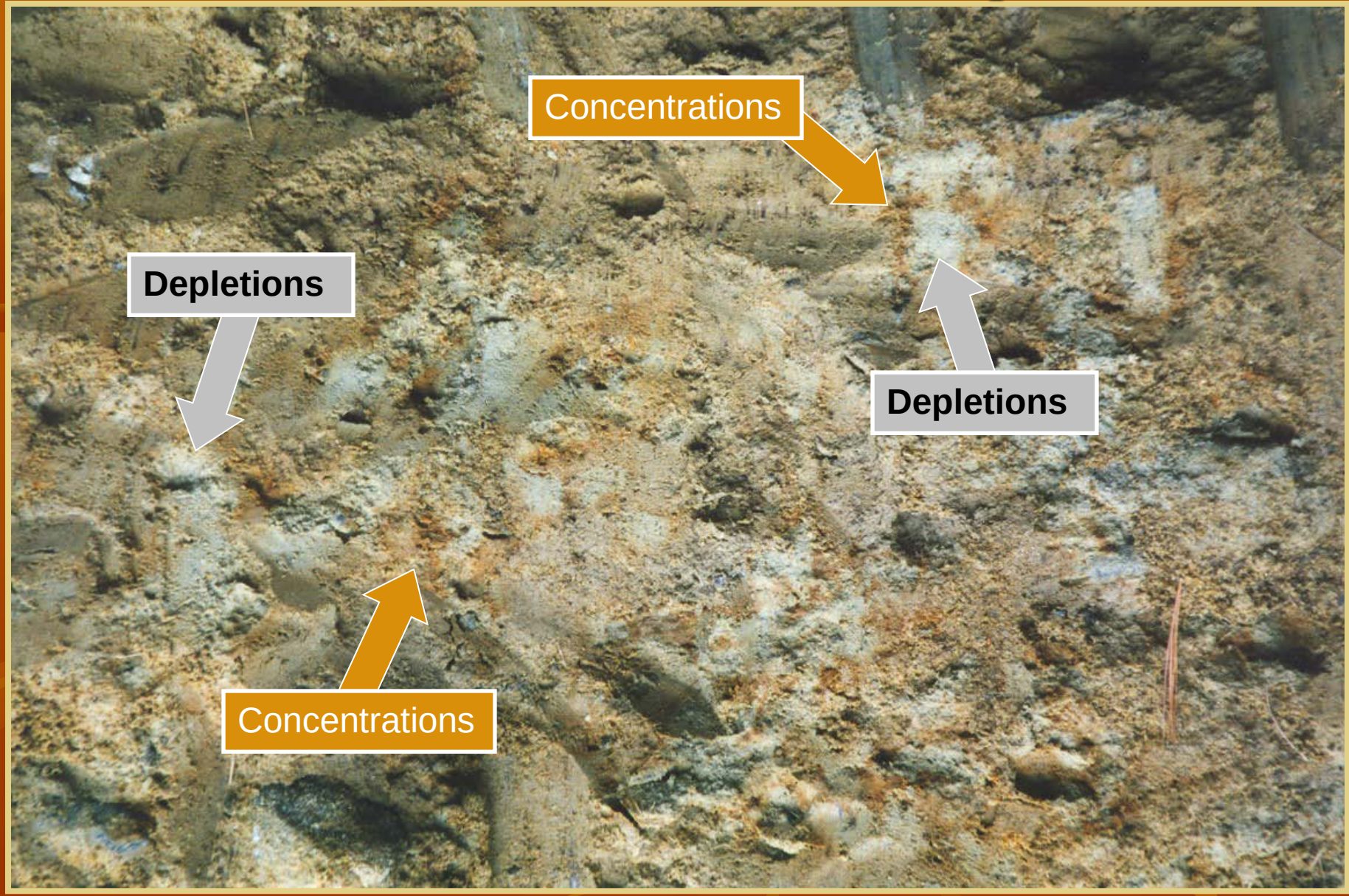


Water Table & Soil Color



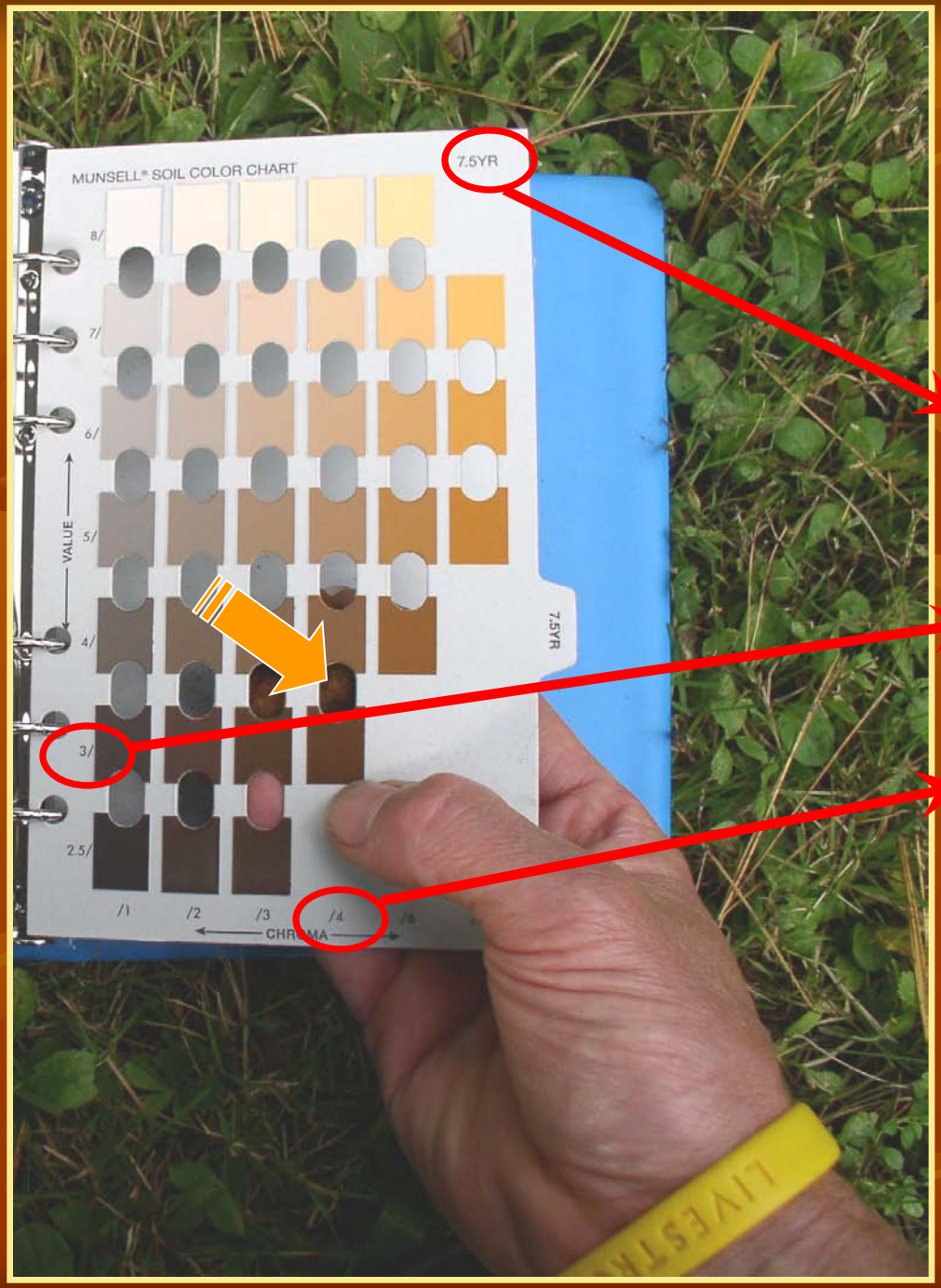
Drainage	Well-drained	Moderately well	Somewhat poorly	Poorly	Very poorly

Wetness Features ~ Mottles or Redoximorphic Features



Soil Color

Record Soil Matrix & Redox Colors



To Record Soil Color

Hue - 7.5YR

Value -------- 3

Chroma ----- 4

Munsell Soil Color

7.5 YR 3/4

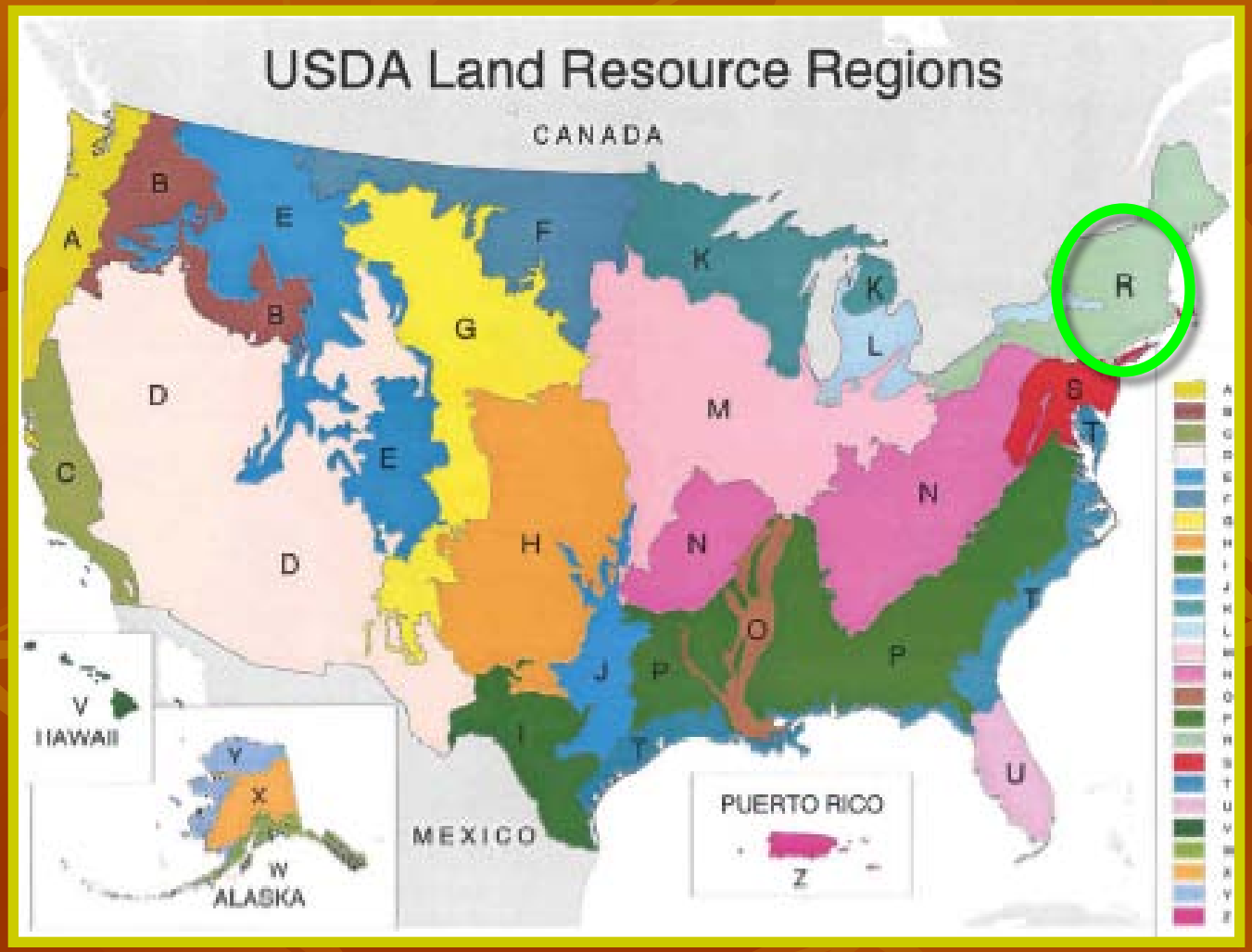
Field Indicators of Hydric Soils in the United States

for use in LRR "R"

Version 7.0 (2010)

NRCS
Natural Resources Conservation Service

Field Indicators for use in LRR R



The Indicators are designed to be regionally specific.

One Page Cheat Sheet for Region R

Field Indicators of Hydric Soils in the United States, Version 7.0 (2010)
Indicators for use in LRR R

Wetland Interior Indicators

All Soils
"All soils" refers to soils with any USDA soil texture. All mineral layers above any of the A indicators, have a dominant chroma of 2 or less, or the layer(s) with a dominant chroma of more than 2 is less than 15 cm (6 in) thick.

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 or less.

A3. Black Histic.
A layer of peat, mucky peat, or muck 20 cm (8in) or more thick that starts within the upper 15 cm (6 in) of the soil surface; has hue of 10YR or yellower, value of 3 or less, and chroma of 1 or less; and is underlain by mineral soil material with chroma of 2 or less.

A4. Hydrogen Sulfide.
A hydrogen sulfide odor within 30 cm (12 in) of the soil surface. ("rotten egg" smell)

A12. Thick Dark Surface.
A layer at least 15 cm (6 in) thick with a depleted or gleyed matrix that has 60 percent or more chroma of 2 or less and starting below 30 cm (12 in) of the surface. The layer(s) above the depleted or gleyed matrix must have value of 2.5 or less and chroma of 1 or less to a depth of at least 30 cm (12 in) and value of 3 or less and chroma of 1 or less in any remaining layers above the depleted or gleyed matrix. Any sandy material above the depleted or gleyed matrix must have at least 70 % of the visible soil particles covered, coated, or similarly masked with organic material.

Sandy Soils
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 less, or the thickness of the layer(s) with a dominant chroma of more than 2 is less than 15 cm (6 inches). In addition, nodules and concretions are not considered to be redox concentrations.

S1. Sandy Mucky Mineral.
A layer of mucky modified sandy soil material 5 cm (2 in) or more thick starting within 15 cm (6 in) of the soil surface.

S4. Sandy Gleyed Matrix.
A gleyed matrix that occupies 60 % or more of a layer starting within 15 cm (6 in) of the soil surface.

S6. Polyvalue Below Surface.
A layer with value of 3 or less and chroma of 1 or less starting within 15 cm (6 in) of the soil surface. At least 70 percent of the visible soil particles must be masked with organic material, viewed through a 10x or 15x hand lens. Observed without a hand lens, the particles appear to be close to 100 % masked. Directly below this layer, 5 percent or more of the soil volume has value of 3 or less and chroma of 1 or less, and the remainder of the soil volume has value of 4 or more and chroma of 1 or less to a depth of 30 cm (12 in) or to the spodic horizon, whichever is less.

Loamy and Clayey Soils
These soils have USDA textures of loamy very fine sand and finer. All mineral layers above any of the F indicators, except for indicators F8, have a dominant chroma of 2 or less, or the layer(s) with a dominant chroma of more than 2 is less than 15cm (6 in) thick.

F2. Loamy Gleyed Matrix.
A gleyed matrix that occupies 60 % or more of a layer starting within 30 cm (12 in) of the soil surface.

Procedure

Where to begin looking. Begin observations at the top of the mineral surface (underneath any and all fibric, hemic, and/or sapric material) except for application of indicators A1, A2 and A3.

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.

***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 or more and chroma of 1; or
2. 5G with value 4 or more and chroma of 1 or 2; or
3. N with value of 4 or more; 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.

For complete Indicators and User Notes go to
http://soils.usda.gov/use/hydric/

***Depleted matrix.** For loamy and clayey material, (and sandy material for the application of Indicators 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 or more and chroma of 1 or less with or without redox concentrations occurring as soft masses and/or pore linings; or
2. Matrix value of 6 or more and chroma of 2 or less 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 percent or more 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 percent or more 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 percent clay has between 5 and 12 percent organic carbon. Mucky modified mineral soil material that has 60 percent clay has between 12 and 18 percent organic carbon. Soils with an intermediate amount of clay have intermediate amounts of organic carbon. Where the organic component is peat (fibric material) or mucky peat (hemic material), mucky mineral soil material does not occur.

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.

Joe Homer / – NH-USDA-NRCS 9/10

One Page Cheat Sheet for Region R

Field Indicators of Hydric Soils in the United States, Version 7.0 (2010)
Indicators for use in LRR R

Wetland Border Indicators

All Soils
"All soils" refers to soils with any USDA soil texture. All mineral layers above any of the layers meeting the requirements of any A indicator(s), except for indicator A16, have a dominant chroma of 2 or less, or the thickness of the layer(s) with a dominant chroma of more than 2 is less than 15 cm (6 in). In addition, nodules and concretions are not considered to be redox concentrations. Use the following indicators regardless of texture.

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

A11. Depleted Below Dark Surface.
A layer with a depleted or gleyed matrix that has 60 percent or more chroma of 2 or less, starting within 30 cm (12 in) of the soil surface, and having a minimum thickness of either:
a. 15 cm (6 in), or
b. 5 cm (2 in) if the 5 cm consists of fragmental soil material.
Loamy or clayey layer(s) above the depleted or gleyed matrix must have value of 3 or less and chroma of 2 or less. Any sandy material above the depleted or gleyed matrix must have value of 3 or less and chroma of 1 or less, and, viewed through a10x or 15x hand lens, at least 70 % of the visible soil particles must be masked with organic material. Observed without a hand lens, the particles appear to be close to 100 percent masked.

Sandy Soils

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

S6. Stripped Matrix.
A layer starting within 15 cm (6 in) of 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 oxides and/or organic matter form a faintly contrasting pattern of two or more [illegible] with diffuse boundaries. The stripped [illegible] or more of the volume and are [illegible]

S7. Dark Surface.
A layer 10 cm (4 in) [illegible] arting within the upper 15 cm (6 in) of the soil surface, with a matrix value 3 of or less and chroma of 1 or less. At least 70 % of the visible soil particles must be masked with organic material, viewed through a 10x or 15x hand lens. Observed without a hand lens, the 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 or less.

S9. Thin Dark Surface.
A layer 5 cm (2 in) or more thick within the upper 15 cm (6 in) of the soil, with value of 3 or less and chroma of 1 or less. At least 70% of the visible soil particles must be masked with organic material, viewed through a 10x or 15x hand lens. Observed without a hand lens, particles appear to be close to 100% masked. This layer is underlain by a layer or layers with value of 4 or less and chroma of 1 or less 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% or more chroma of 2 or less with a minimum thickness of either:
a. 5 cm (2 in) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil, or
b. 15 cm (6 in), starting within 25 cm (10 in) of the soil surface.

F6. Redox Dark Surface.
A layer that is at least 10 cm (4 in) thick, is entirely within the upper 30 cm (12 in) of the mineral soil, and has:
a. Matrix value of 3 or less and chroma of 1 or less and 2% or more distinct or prominent redox concentrations occurring as soft masses or pore linings, or
b. Matrix value of 3 or less and chroma of 2 or less and 5% or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

F7. Depleted Dark Surface.
Redox depletions with value of 5 or more and chroma of 2 or less in a layer that is at least 10 cm (4 in) thick, is entirely within the upper 30 cm (12 in) of the mineral soil, and has:
a. Matrix value of 3 or less and chroma 1 or less and 10 % or more redox depletions, or
b. Matrix value of 3 or less and chroma of 2 or less and 20 % or more redox depletions.

F8. Redox Depressions
In closed depressions subject to ponding, 5 % or more distinct or prominent redox concentrations occurring as soft masses or pore linings in a layer that is 5 cm (2 in) or more thick and is entirely within the upper 15 cm (6 in) of the soil.

Regional Supplement Test Indicators

S3. 5 cm Mucky Peat or Peat.
A layer of mucky peat or peat 5 cm (2 in) or more thick with value 3 of or less and chroma of 2 or less, starting within 15 cm (6 in) of the soil surface, and underlain by sandy material.

TF2. Red Parent Material.
In parent material with hue of 7.5YR or redder, a layer at least 10 cm (4 in) thick with a matrix value and chroma of 4 or less and 2 % or more redox depletions and/or redox concentrations occurring as soft masses and/or pore linings. The layer is entirely within 30 cm (12 in) of the soil surface. The minimum thickness requirement is 5 cm (2 in) if the layer is the mineral surface layer.

TF12. Very Shallow Dark Surface. In depressions and other concave landforms, one of the following:
a. If bedrock occurs between depths of 15cm (6 in) and 25cm (10 in), a layer at least 15cm (6 in) thick starting within 10cm (4 in) of the soil surface and having value of 3 or less and chroma of 1 or less; the remaining soil to bedrock must have the same colors as above or any other color that has chroma of 2 or less.
b. If bedrock occurs within a depth of 15cm (6 in), more than half of the soil thickness must have value of 3 or less and chroma of 1 or less and the remaining soil to bedrock must have the same colors as above or any other color that has chroma of 2 or less.

TA6. Mesic Spodic. *For testing in MLRAs 144A and 145.*
A layer 5 cm (2in) or more thick, starting within 15 cm (6 in) of the mineral soil surface, that has value of 3 or less and chroma of 2 or less and is underlain by either:
a. A layer(s) 8 cm (3in) or more thick occurring within 30 cm (12in) of the mineral soil surface, having value and chroma of 3 or less, and showing evidence of spodic development; or
b. A layer(s) 5 cm (2 in) or more thick occurring within 30 cm (12 in) of the mineral soil surface, having value of 4 or more and chroma of 2 or less, and directly underlain by a layer(s) 8 cm (3 in) or more thick having value and chroma of 3 or less and showing evidence of spodic development.

Field Indicators of Hydric Soils in the US

Land Resource Region "R"

All soils

Interior

A1, A2, A3, A4, A12

Boundary

A5, A11

Sandy soils

Interior

S1, S3, S4, S8

Boundary

S5 S6, S7, S9

Loamy soils

Interior

F2

Boundary

F3 F6 F7, F8, F12

Three Major Divisions

- All soils ("A" Indicators)
- Sandy soils ("S" Indicators)
- Loamy soils ("F" Indicators)

All Soils ("A" Indicators) for Interior (very wet) ecosystems

- A1. Histosol
- A2. Histic Epipedon
- A3. Black Histic
- A4. Hydrogen Sulfide
- A12. Thick Dark Surface

A1. Histosol

A1. Histosol

A1. Histosol (for use in all LRRs)

Classifies as a Histosol (except Folist).

User Notes: In a Histosol, 40 cm (16 inches) or more of the upper 80 cm (32 inches) is organic soil material. Organic soil materials have an organic carbon content (by weight) of 12 to 18 percent, or more, depending on the clay content of the soil.

These materials include muck (sapric soil material), mucky peat (hemic soil material), and peat (fibric soil material).

A2. Histic Epipedon

A2. Histic Epipedon

A2. Histic Epipedon.

For use in all LRRs.
A histic epipedon underlain by mineral soil material with chroma of 2 or less.

A3. Black Histic

A3. Black Histic

A3. Black Histic. For use in all LRRs.

A layer of peat, mucky peat, or muck 20 cm (8 inches) or more thick that starts within the upper 15 cm (6 inches) of the soil surface; has hue of 10YR or yellower, value of 3 or less, and chroma of 1 or less; and is underlain by mineral soil material with chroma of 2 or less.

User Notes: Unlike indicator A2, this indicator does not require proof of aquic conditions or artificial drainage.

A4. Sulfihemist

A4. Hydrogen Sulfide.

A4. Hydrogen Sulfide.

For use in all LRRs.

A hydrogen sulfide odor w/in 30 cm (12 inches) of the soil surface.

User Notes: This "rotten egg smell" indicates that sulfate-sulfur has been reduced and therefore the soil is anaerobic. In most hydric soils, the sulfidic odor occurs only when the soil is saturated and anaerobic.

A12. Thick Dark Surface

A12. Thick Dark Surface

A12. Thick Dark Surface.

A layer at least 15 cm (6 inches) thick with a depleted or gleyed matrix that has 60 percent or more chroma of 2 or less and starting below 30 cm (12 inches) **below** the surface. The layer(s) above the depleted or gleyed matrix must have value of 2.5 or less and chroma of 1 or less to a depth of at least 30 cm (12 inches) and value of 3 or less and chroma of 1 or less in any remaining layers above the depleted or gleyed matrix. Any sandy material above the depleted or gleyed matrix must have at least 70 percent of the visible soil particles covered, coated, or similarly masked with organic material.

Boundary Indicators for All Soils

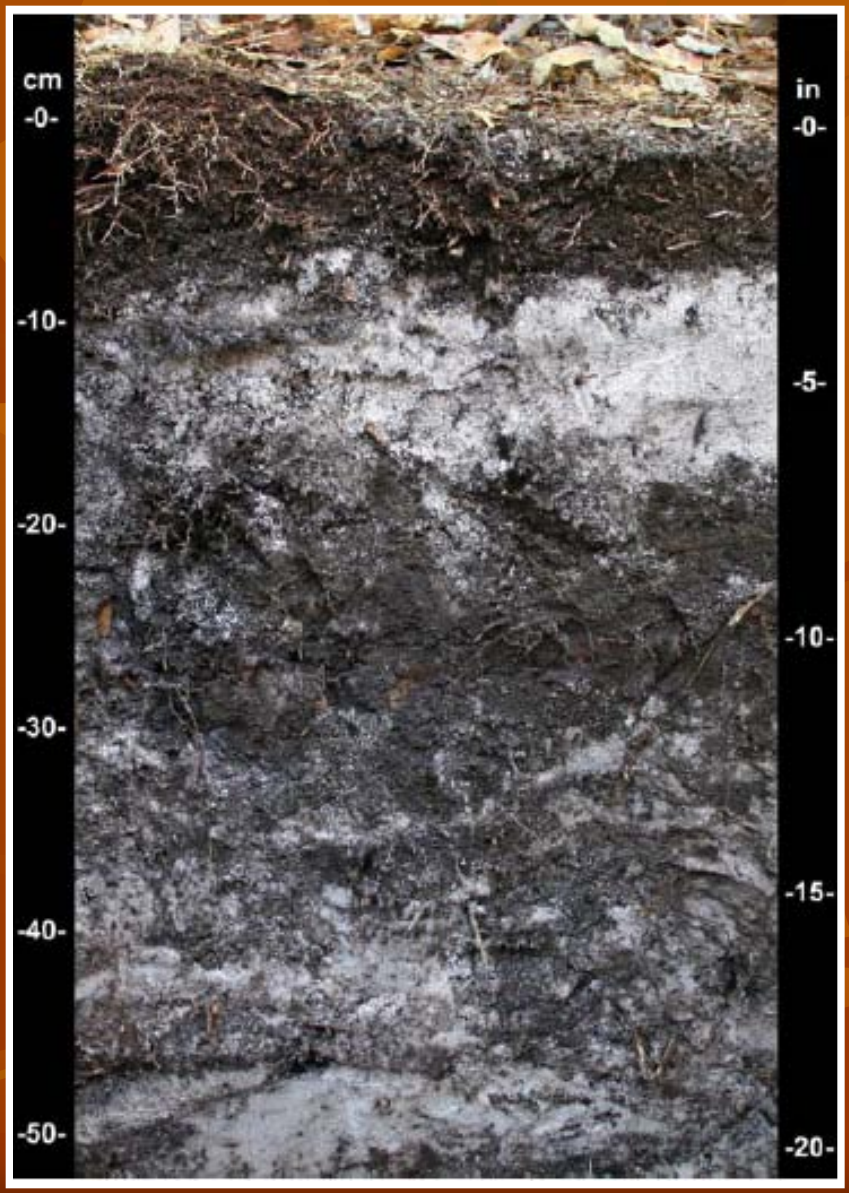
- A5. Stratified Layers
- A11. Depleted Below Dark Surface

A5. Stratified Layers

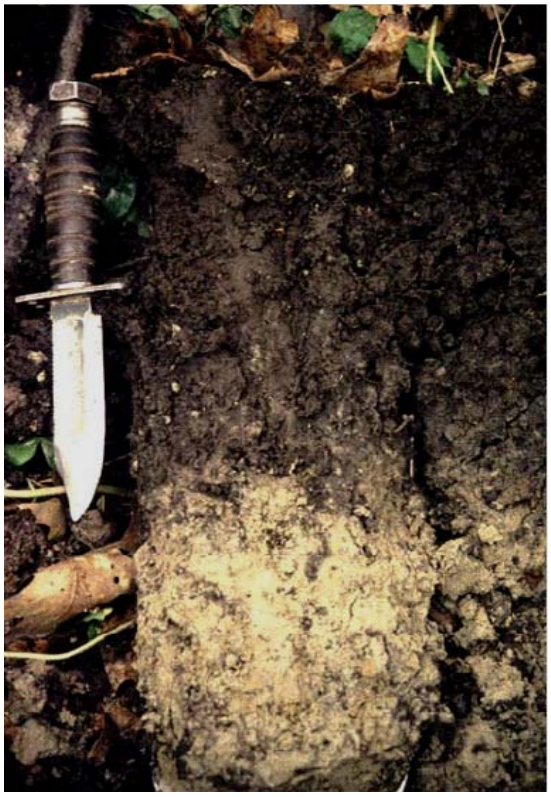
A5. Stratified Layers

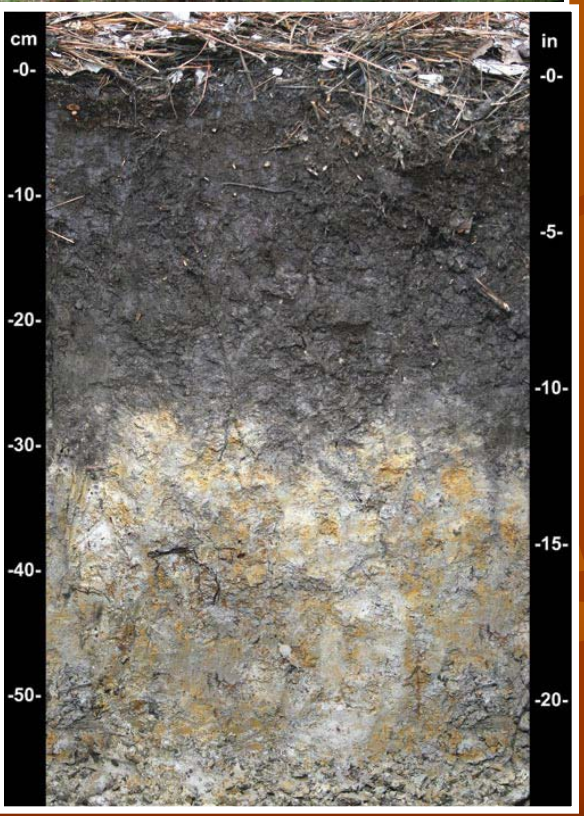
A5. Stratified Layers

Several stratified layers starting within the upper 15 cm (6 inches) of the soil surface. One or more of the layers has value 3 or less with chroma 1 or less and/or it is muck, mucky peat, peat, or mucky modified mineral texture. The remaining layers have chroma of 2 or less.



A11. Depleted Below Dark Surface





A11. Depleted Below Dark Surface

A11. Depleted Below Dark Surface.

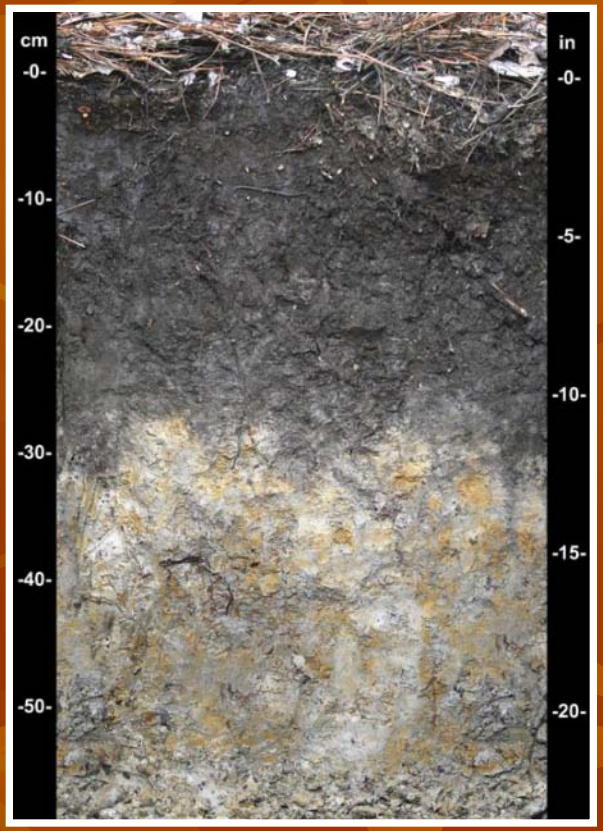
A layer with a depleted or gleyed matrix that has 60 or more percent chroma of 2 or less, starting within 30 cm (12 inches) of the soil surface, and having a minimum thickness of either:

a. 15 cm (6 inches), or

b. 5 cm (2 inches) if the 5 cm consists of fragmental soil material.

Loamy or clayey layer(s) above the depleted or gleyed matrix must have value of 3 or less and chroma of 2 or less.

Any sandy material above the depleted or gleyed matrix must have value of 3 or less and chroma of 1 or less, and at least 70 percent of the visible soil particles must be covered, coated, or similarly masked with organic material.



A11. Depleted Matrix ~ Defined

Depleted Matrix.

1. Matrix value of 5 or more and chroma of 1 or less with or without redox concentrations occurring as soft masses and/or pore linings;

~ or

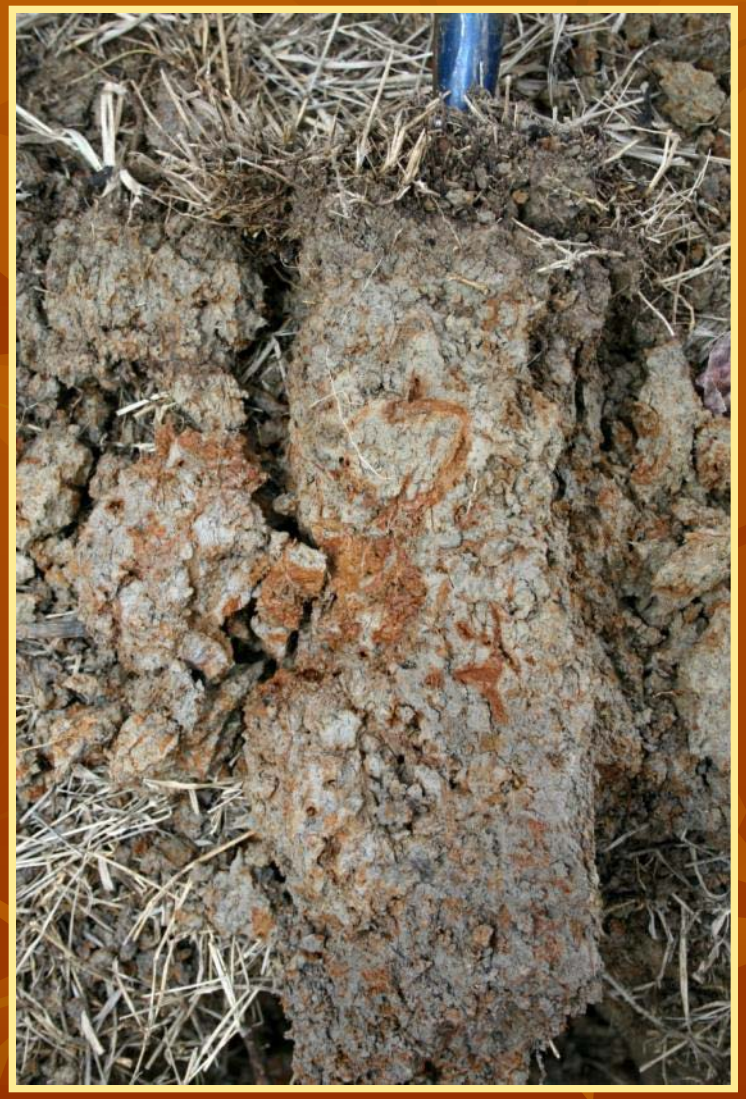
2. Matrix value of 6 or more and chroma of 2 or less with or without redox concentrations occurring as soft masses and/or pore linings;

~ or

3. Matrix value of 4 or 5 and chroma of 2 and 2 percent or more distinct or prominent redox concentrations occurring as soft masses and/or pore linings;

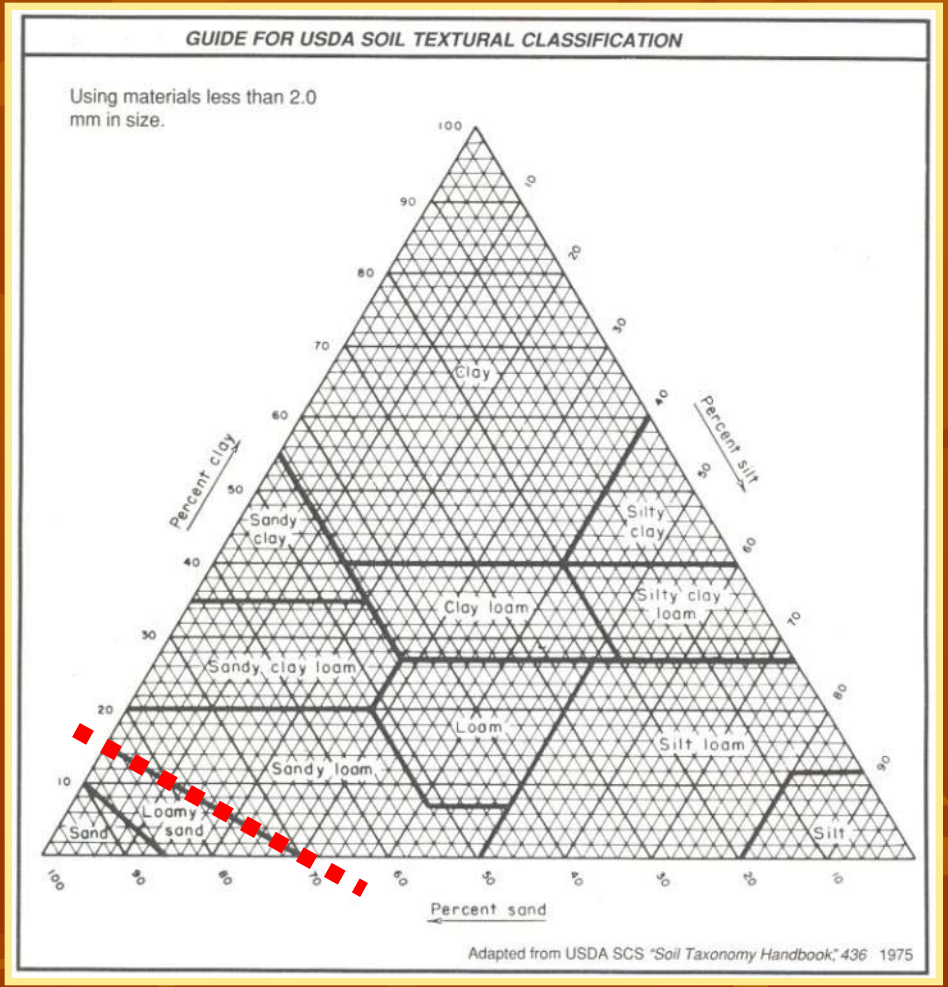
~ or

4. Matrix value of 4 and chroma of 1 and 2 percent or more distinct or prominent redox concentrations occurring as soft masses and/or pore linings.



Sandy Soil Indicators

- Loamy fine sand or coarser



Sandy Soils Indicators for Interior (Very Wet) Ecosystems

- S1. Sandy Mucky Mineral
- S3. 5 cm Mucky Peat or Peat
  - ~ For testing in LRR R
- S4. Sandy Gleyed Matrix
- S8. Polyvalue Below Surface

S1. Sandy Mucky Mineral

S1. Sandy Mucky Mineral

S1. Sandy Mucky Mineral.

A layer of mucky modified sandy soil material 5 cm (2 inches) or more thick starting within 15 cm (6 inches) of the soil surface.

S4. Sandy Gleyed Matrix

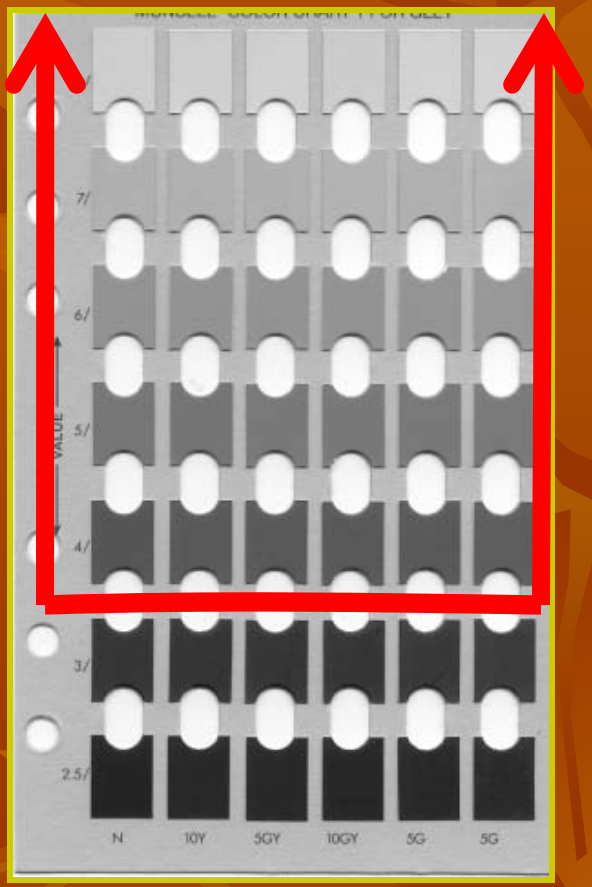
S4. Sandy Gleyed Matrix

S4. Sandy Gleyed Matrix.

A **gleyed** matrix that occupies 60 percent or more of a layer starting within 15cm (6 inches) of the soil surface.

Gleyed Matrix

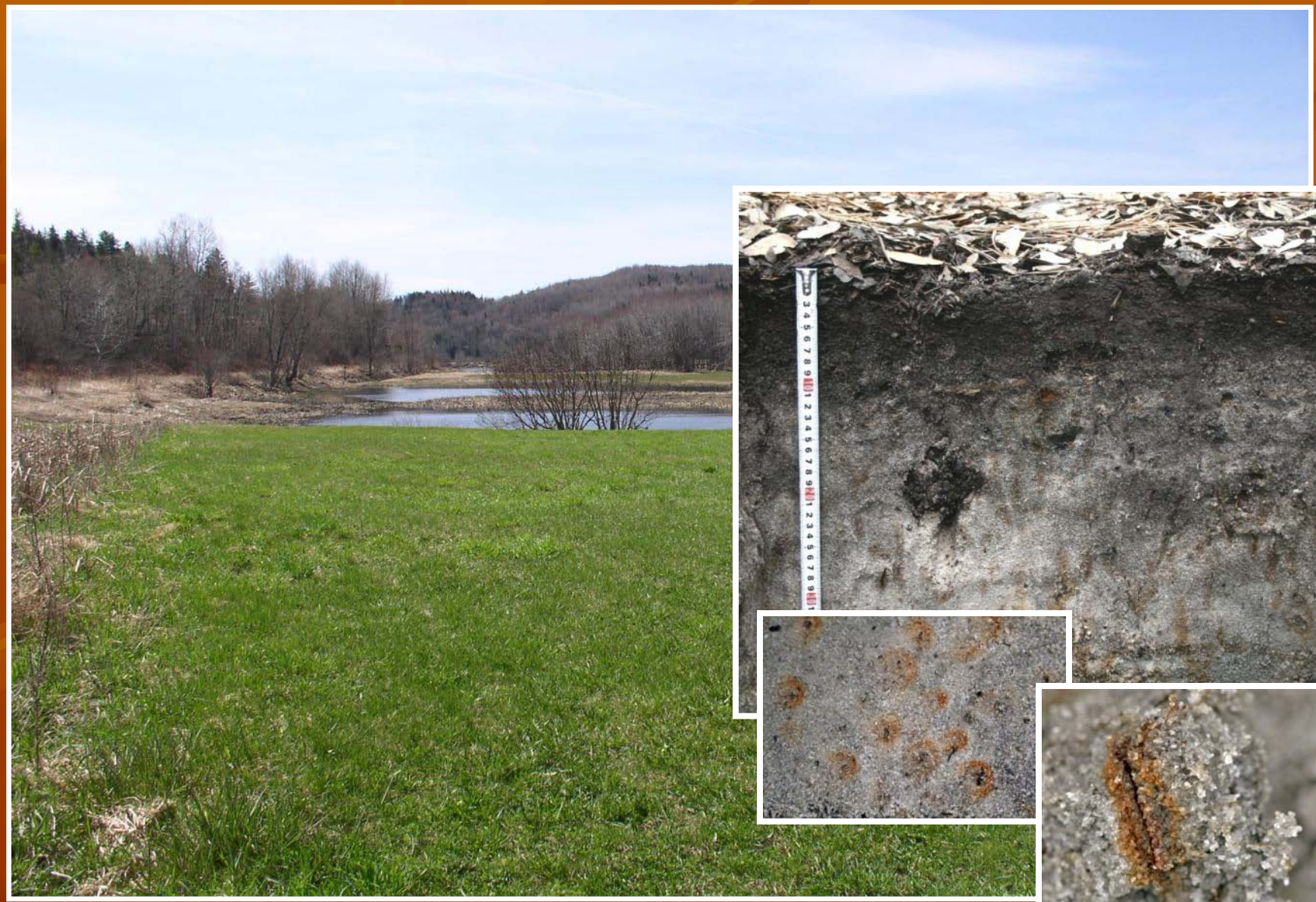
- Gray colors are not gleyed colors
- The range of colors for the gleyed matrix is value 4 or more on either of the two gley pages.



Boundary Indicators for Sandy Soils

- S5. Sandy Redox
- S6. Stripped Matrix
- S7. Dark Surface. Dark Surface
- S9. Thin Dark Surface

S5. Sandy redox



S5. Sandy redox

S5. Sandy Redox.

A layer starting within 15 cm (6 inches) of the soil surface that is at least 10 cm (4inches) thick and has a matrix with 60 percent or more chroma of 2 or less with 2 % or more distinct or prominent redox concentrations occurring as soft masses &/or pore linings.

S6. Stripped Matrix

S6. Stripped Matrix

S6. Stripped Matrix.

A layer starting within 15 cm (6 inches) of the soil surface in which iron-manganese oxides and/or organic matter have been stripped from the matrix (in places) and the primary base color of the soil material has been exposed. The stripped areas and translocated oxides and/or organic matter form a faint, **diffuse splotchy pattern** of two or more colors. The stripped zones are 10 percent or more of the volume; they are rounded and approximately 1 to 3 cm (0.5 to 1 inch) in diameter.

S7. Dark Surface

S7. Dark Surface

S7. Dark Surface.

A layer 10 cm (4 inches) or more thick starting within the upper 15 cm (6 inches) of the soil surface and with a matrix value of 3 or less and chroma of 1 or less. At least **70 percent of the visible soil particles must be covered, coated, or similarly masked with organic material**. The matrix color of the layer immediately below the dark layer must have the same colors as those described above or any color that has chroma of 2 or less.

S9. Thin Dark Surface

S9. Thin Dark Surface

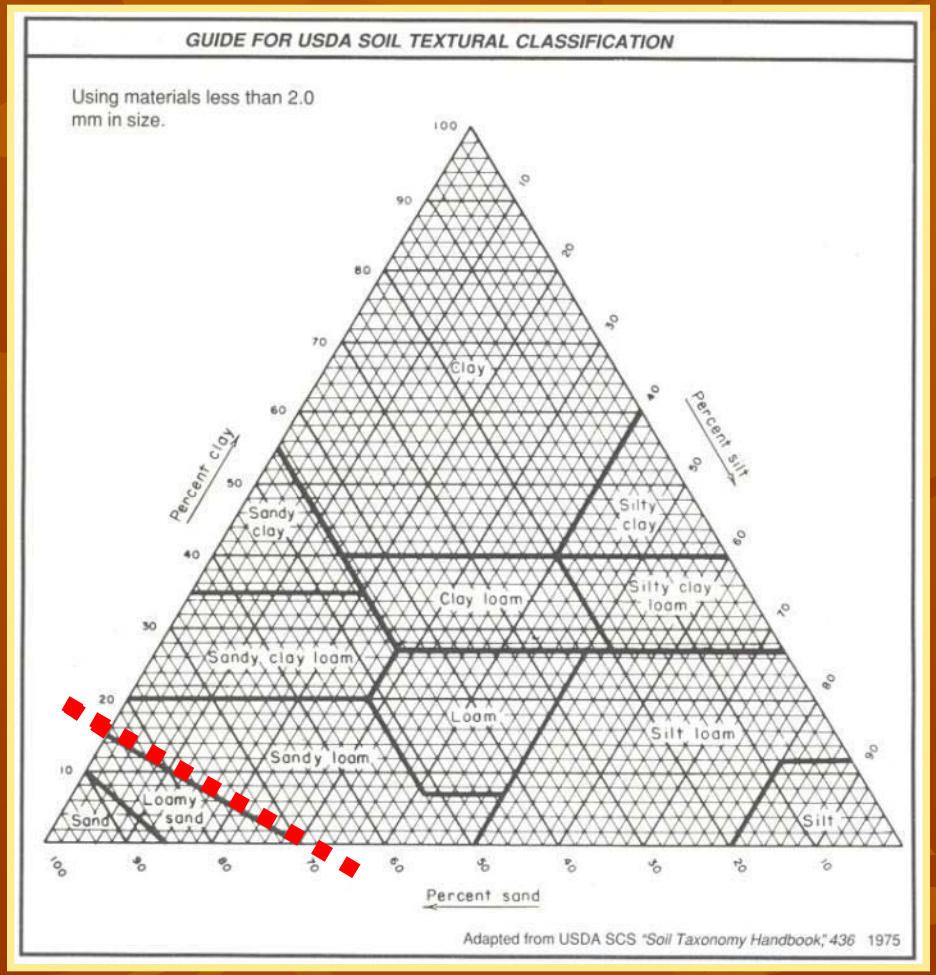
S9. Thin Dark Surface.

A layer 5 cm (2 inches) or more thick within the upper 15 cm (6 inches) of the soil, with value of 3 or less and chroma of 1 or less. At least 70% of the visible soil particles in this layer must be covered, coated, or masked with organic material. This layer is underlain by a layer(s) with value of 4 or less and chroma of 1 or less to a depth of 30 cm (12 inches) or to the spodic horizon, whichever is less.

User Notes: applies to soils with a very dark gray or black near-surface layer that is at least 2 inches thick underlain by a layer in which organic matter has been translocated resulting in an even distribution of organic matter in the eluvial (E) horizon. Commonly occurs in hydric Spodosols, but a spodic horizon is not required.

Loamy and Clayey Soils

- Loamy very fine sand or finer



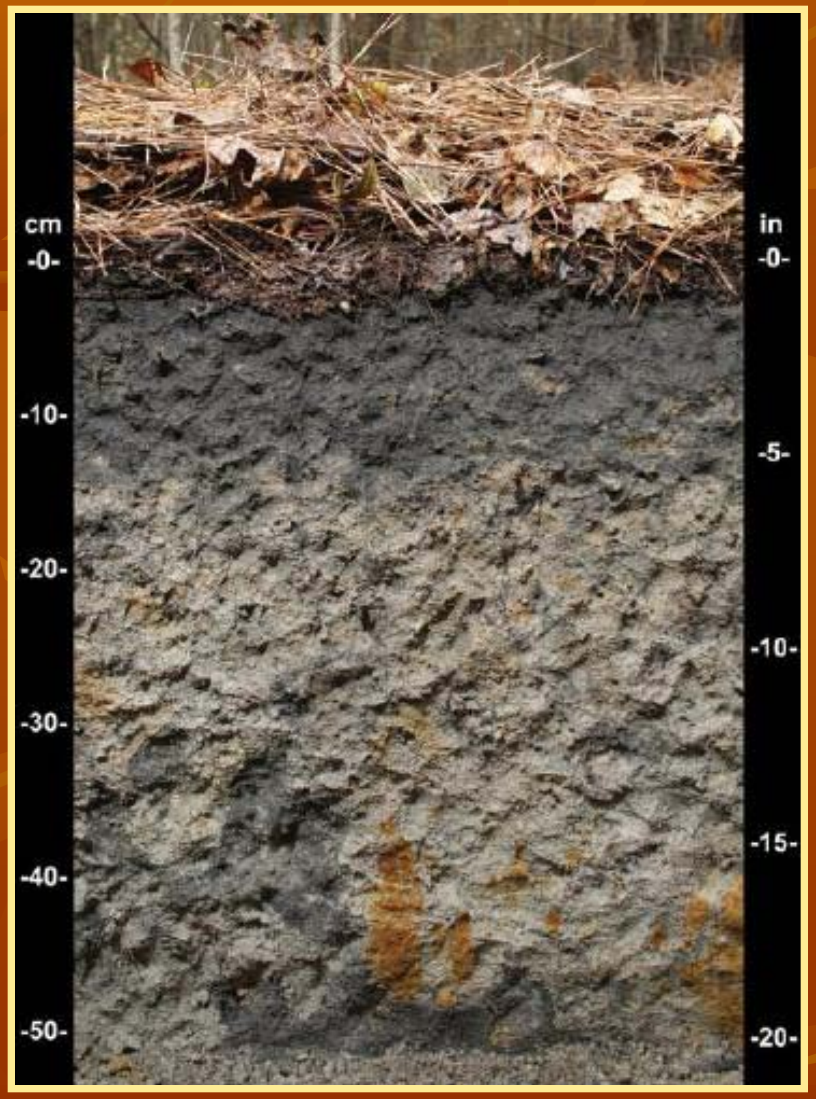
Loamy & Clayey Indicators for Interior (Very Wet) Ecosystems

- F2. Loamy Gleyed Matrix

F2. Loamy Gleyed Matrix

F2. Loamy Gleyed Matrix.

A gleyed matrix that occupies 60 percent or more of a layer starting within 30 cm (12 inches) of the soil surface.

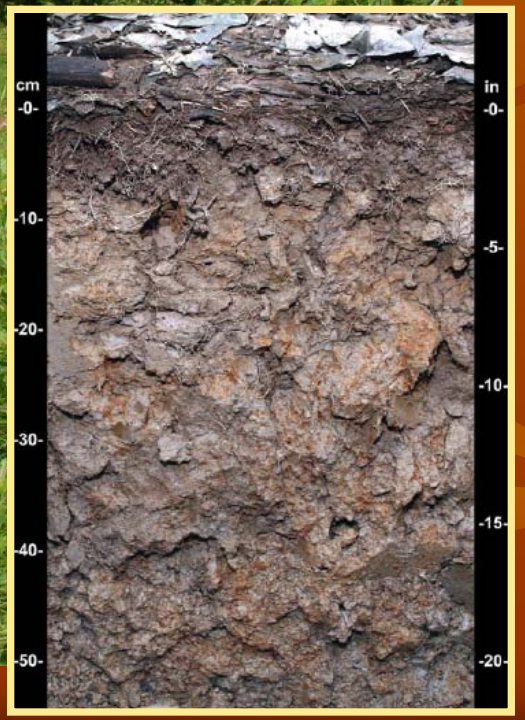


Boundary Indicators in Loamy and Clayey Soils

- F3. Depleted Matrix
- F6. Redox Dark Surface
- F7. Depleted Below Dark Surface
- F8. Redox Depressions
- F12. Iron/Manganese Masses

for testing in Region "R"

F3. Depleted Matrix



F3. Depleted Matrix

F3. Depleted Matrix.

A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either:

a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15cm (6 inches) of the soil,

or

b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface.

F3. Depleted Matrix ~ Defined

Depleted Matrix.

1. Matrix value of 5 or more and chroma of 1 or less with or without redox concentrations occurring as soft masses and/or pore linings;

~ or

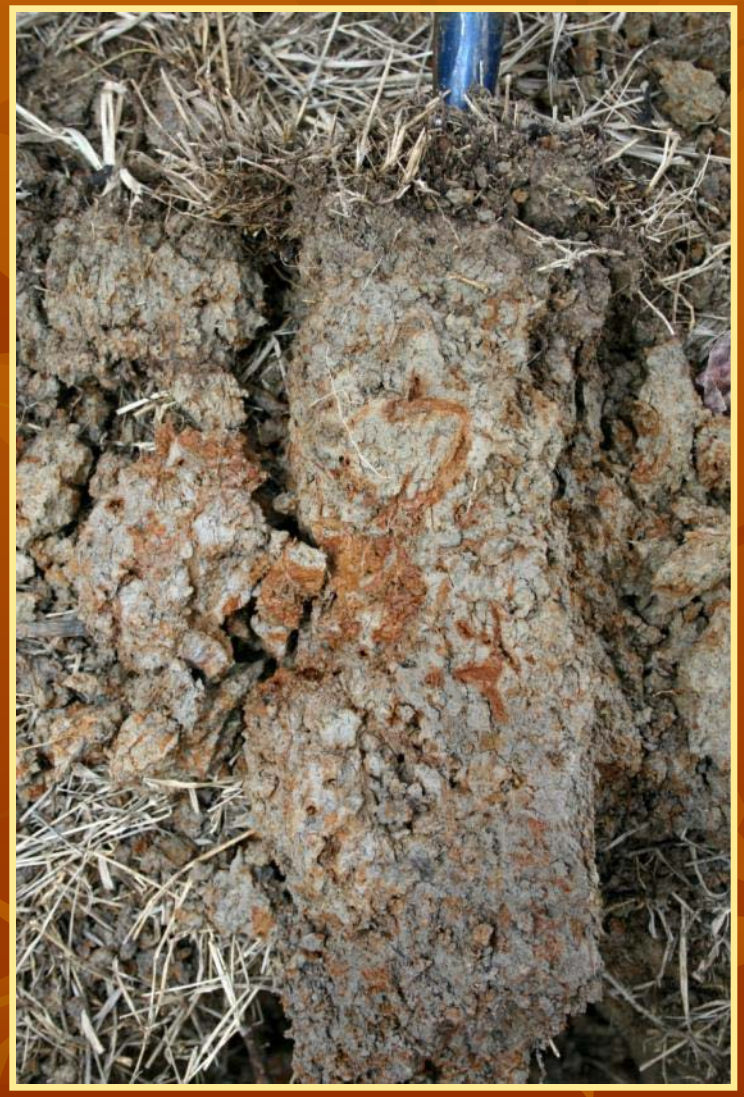
2. Matrix value of 6 or more and chroma of 2 or less with or without redox concentrations occurring as soft masses and/or pore linings;

~ or

3. Matrix value of 4 or 5 and chroma of 2 and 2 percent or more 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 percent or more distinct or prominent redox concentrations occurring as soft masses and/or pore linings.



F6. Redox Dark Surface

F6. Redox Dark Surface

F6. Redox Dark Surface.

A layer that is at least 10 cm (4 inches) thick, is entirely within the upper 30cm (12 inches) of the mineral soil, and has:

a. Matrix value of 3 or less and chroma of 1 or less and 2 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings,

or

b. Matrix value of 3 or less and chroma of 2 or less and 5 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

F7. Depleted Dark Surface

F7. Depleted Dark Surface

F7. Depleted Dark Surface.

Redox depletions with value of 5 or more and chroma of 2 or less in a layer that is at least 10cm (4 inches) thick, is entirely within the upper 30cm (12 inches) of the mineral soil, and has:

a. Matrix value of 3 or less and chroma 1 or less and 10 percent or more redox depletions, or

b. Matrix value of 3 or less and chroma of 2 or less and 20 % or more redox depletions.

F8. Redox Depressions

F8. Redox Depressions

F8. Redox Depressions.

In closed depressions subject to ponding, 5 percent or more distinct or prominent redox concentrations occurring as soft masses or porelinings in a layer that is 5 cm (2 inches) or more thick and is entirely within the upper 15 cm (6 inches) of the soil.

User Notes: Occurs on depressional landforms, such as vernal pools.


USDA
United States Department of Agriculture
In cooperation with the National Technical Committee for Hydric Soils
NRCS
Natural Resources Conservation Service
Field Indicators of Hydric Soils in the United States
A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010
YES! It's A Hydric Soil ?

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NRCS Natural Resources Conservation Service

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Basics of Wetland Soil Identification

"The New Regional Indicators"

May 16, 2011

Joe Homer

NRCS Natural Resources Conservation Service