

Hydric Soil Indicators - Remainder April 2015

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OBJECTIVES

- Define and describe seasonal high water table indicators for hydric soils
- Provide correct methodology for hydric soil indicator identification

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NOTE

Additional information on certain slides will be found in the “NOTES” section and will only be visible in the “normal” view in PowerPoint

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Remainder of the Field Indicators (Not on test)

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NOTE

- While these are the “Hydric Soil Indicators” (HSI), the language that “makes” the soil hydric has been bracketed. Ignore this information to use the indicator for SHWT indicator only. Example: [starting within the upper 15 cm (6 inches) of the soil surface.]
- This is to facilitate the idea that FDOH uses all HSI as SHWT indicators only.
- Additional language used for clarification will be underlined

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NOTE

- The laminated HSI sheets have not been bracketed as in this presentation in order to provide consistency with all other HSI information from other sources

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S4. Sandy Gleyed Matrix

- For use in all of Florida
- A gleyed matrix which occupies 60% or more of a layer [starting within 15 cm (6 inches) of the soil surface]
- Gleyed matrix has already been defined in the previous presentation

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Indicator S4 (Sandy Gleyed Matrix). The gleyed matrix begins at the soil surface. Scale is inches (R) and cm (L).

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A1. Histosol

- For use in all LRRs
- Soil classifies as a Histosol (except Folist)
- Normally $\geq 16''$ (40 cm) of top 32'' (80 cm) is organic material such as muck, mucky peat and peat

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- Indicator A1 (Histosols). Muck is >1 meter thick
- This soil has an organic carbon content of 17 percent in the upper 30 cm and 23 percent to a depth of 1 meter
- The field estimated percent organic carbon content (by experienced soil scientists) was 40 percent in the 2 layers

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A2. Histic Epipedon

- For use in all Florida LRRs
- A histic epipedon (according to Soil Taxonomy) underlain by mineral soil material with a chroma of 2 or less
- User Notes: Most histic epipedons are surface horizons 20 cm (8 inches) or more thick of organic soil material
- Aquic conditions or artificial drainage are required, see Keys to Soil Taxonomy (2007) for complete definition

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- Indicator A2 (Histic Epipedon)
- Proof of aquic conditions is required
- Generally, Histosols have more than 16 inches of organic soil material and Histic epipedons have 8 to 16 inches of organic materials

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A3. Black Histic

- For use in all LRRs
- A layer of peat, mucky peat, or muck 20 cm (8 inches) or more thick [starting within the upper 15 cm (6 inches) of the soil surface] having hue 10YR or yellower, value 3 or less, and chroma 1 or less underlain by mineral soil material with a chroma of 2 or less
- Does not require proof of aquic conditions

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- Indicator A3 (Black Histic)
- Proof of aquic conditions is not required
- Scale is inches (R) and cm (L)

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A4. Hydrogen Sulfide

- For use in all LRRs
- A hydrogen sulfide odor [within 30 cm (12 inches) of the soil surface]
- **Must** be a “rotten egg” odor
- Other “unpleasant” odors exist such as mercaptans which contain sulfur compounds (e.g. smell placed in natural gas) but is not hydrogen sulfide

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- **Indicator A4 (Hydrogen Sulfide) would most likely occur here**
- **Anaerobic conditions would probably occur in this salt marsh throughout the year**

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A11 Depleted Below Dark Surface

- *For use in all of Florida*
- A layer with a depleted or gleyed matrix that has 60% or more chroma 2 or less [starting within 30 cm (12 inches) of the soil surface] that has a minimum thickness of either:
 - a. 15 cm (6 inches), or
 - b. 5 cm (2 inches) if the 5 cm (2 inches) consists of fragmental soil material

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A11 Depleted Below Dark Surface

- Loamy/clayey layer(s) above the depleted or gleyed matrix must have value 3 or less and chroma 2 or less
- Any sandy material above the depleted or gleyed matrix must have value 3 or less, chroma 1 or less and meet 70% masked criterion

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- Indicator A11 (Depleted Below Dark Surface)
- This indicator is similar to F3 (Depleted Matrix)

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A12 Thick Dark Surface

- For use in all LRRs
- A layer at least 15cm (6") thick with a depleted or gleyed matrix that has 60% or more chroma ≤ 2 [starting below 30cm (12") of the surface]
- The layer(s) above the depleted or gleyed matrix must have value ≤ 2.5 and chroma ≤ 1 to a depth of at least 30cm (12") and value ≤ 3 and chroma ≤ 1 in any remaining layers above the depleted or gleyed matrix

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A12 Thick Dark Surface

- Any sandy material above the depleted or gleyed matrix must meet the 70 % masked criterion

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A12 Thick Dark Surface



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Indicator A12 (Thick Dark Surface)
Deep observation is often necessary

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Indicator A12 (Thick Dark Surface)
A depleted matrix is below the mollic epipedon

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F3. Depleted Matrix

- Term has been previously defined
- *For use in all of Florida*
- A layer with a depleted matrix that has 60% or more chroma 2 or less that has a minimum thickness of either:
 - a. 5 cm (2 inches) if 5 cm (2 inches) is entirely within the upper 15 cm (6 inches) of the soil, or
 - b. 15 cm (6 inches) [and starts within 25 cm (10 inches) of the soil surface] beginning at any depth

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Indicator F3
(Depleted Matrix)
The chroma is 1
Redox
concentrations are
present but not
required

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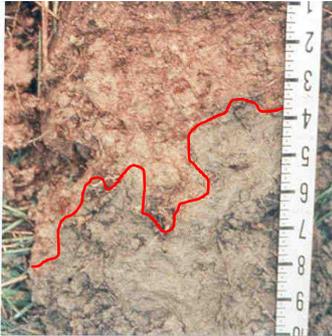
Indicator F3
(Depleted Matrix)
The chroma is 2
Redox
concentrations are
present as required

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Indicator F3 (Depleted Matrix)
The chroma is 1 within a depth of about 10 to 15 cm
Redox concentrations are absent
Scale is inches

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Indicator F3 (Depleted Matrix)
The chroma is 2 below a depth of about 15 cm
Redox concentrations are present as required
Scale is inches

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F6. Redox Dark Surface

- *For use in all of Florida*
- A layer at least 10 cm (4") thick [entirely within the upper 30 cm (12") of the mineral soil] that has:
 - a. matrix value ≤ 3 and chroma ≤ 1 with $\geq 2\%$ distinct or prominent redox concentrations as soft masses or pore linings, or
 - b. matrix value ≤ 3 and chroma 2 with $\geq 5\%$ distinct or prominent redox concentrations as soft masses or pore linings

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Redox Dark Surface User Notes:

- Very common indicator used to delineate wetlands in soils with dark-colored surface layers
- Redox concentrations in high organic-content mineral soils with dark surfaces are often small and difficult to see as it can mask some/all of the concentrations
- Careful examination is required to see what are often brownish redox concentrations in the darkened materials

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Redox in Dark Colored Soils

- *Where the matrix has Value ≤ 3 and Chroma ≤ 1 , redox concentrations may have sharp (not diffuse) boundaries*
- *Caused by organic material masking the redox concentration*

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Indicator F6 (Redox Dark Surface)
 Prominent redox concentrations as soft masses and pore linings are present
 Below the dark epipedon is indicator A11 (Depleted Below Dark Surface)
 Scale is cm

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Indicator F6 (Redox Dark Surface)
Prominent redox concentrations as soft masses and pore linings are present
Often, as in this soil the redox concentrations are small (fine)

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F7. Depleted Dark Surface

- For use in all of Florida
- Redox depletions, with value ≥ 5 and chroma ≤ 2 , in a layer at least 10 cm (4") thick [entirely within the upper 30 cm (12") of the mineral soil] that has:
 - a. matrix value 3 or less and chroma 1 or less and $\geq 10\%$ redox depletions, or
 - b. matrix value ≤ 3 and chroma 2 and $\geq 20\%$ redox depletions

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Indicator F7 (Depleted Dark Surface).
Depletions as they occur within a dark surface layer.



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F8. Redox Depressions

- For use in all of Florida
- In closed depressions subject to ponding, $\geq 5\%$ distinct or prominent redox concentrations as soft masses or pore linings in a layer 5 cm (2 inches) or more thick [entirely within the upper 15 cm (6") of the soil surface]
- This indicator is restricted to depressional landforms

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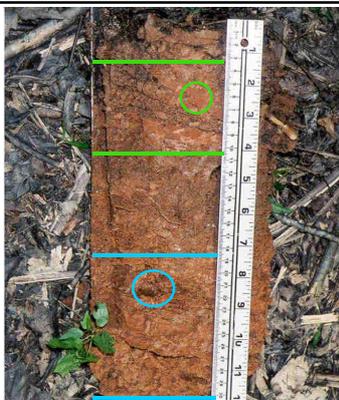
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F8. REDOX DEPRESSIONS
The areas between the green (upper 2) bars and the blue (lower 2) bars meet the indicator by having more than 5% redox concentrations of iron and redox concentrations of iron/manganese, respectively

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F10. Marl (new info highlighted)

- For use in LRR U
- A layer of marl with a value ≥ 5 and chroma < 2 [starting within 10 cm (4 inches) of the soil surface]

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Indicator F10 (Marl)
This indicator is known to occur only in south Florida
Scale is cm

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F12. Iron/Manganese Masses

- For use in LRRs P and T
- On flood plains, a layer ≥ 10 cm (4") thick with $\geq 40\%$ chroma ≤ 2 , and $\geq 2\%$ distinct or prominent redox concentrations as soft iron/manganese masses with diffuse boundaries

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F12. Iron/Manganese Masses

- [The layer occurs entirely within 30 cm (12 inches) of the soil surface]
- Most commonly Iron/manganese masses have value and chroma of 3; sometimes they are black
- The thickness requirement is waived if the layer is the mineral surface layer
- Note landform restriction (floodplains)

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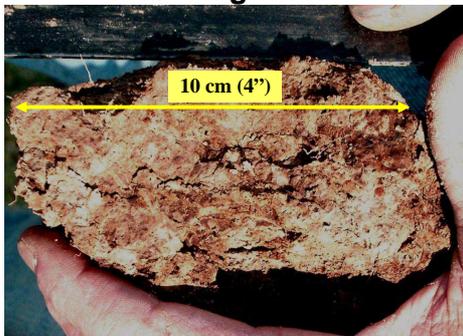
Indicator F12.
(Iron/Manganese
Masses) in a 40
percent depleted
(gray) matrix
Scale is inches

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F12. Iron/Manganese Masses



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F13. Umbric Surface

- For use in all Florida
- In depressions and other concave landforms
- A layer ≥ 25 cm (10") thick [starting within 15 cm (6") of the soil surface]
- Upper 15 cm (6") must have value ≤ 3 and chroma ≤ 1 , and the lower 10 cm (4") of the layer must have the same colors as above or any other color that has a chroma ≤ 2

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Indicator F13 (Umbric Surface)
This umbric surface is about 30 cm. thick (green bar)
Scale is inches

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F22. Very Shallow Dark Surface

For use in MLRA 138 of LRR P, MLRA 154 of LRR U, and West Florida portion of MLRA 152A in LRR T

SEE NEXT 4 SLIDES

Note: MLRA means Major Land Resource Area

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In depressions and flood plains subject to frequent ponding and/or flooding, one of the following

- a) if bedrock occurs between 15 cm (6 inches) and 25 cm (10 inches), a layer at least 15 cm (6 inches) thick [starting within 10 cm (4 inches) of the soil surface] with value 2.5 or less and chroma 1 or less,

Continued next slide



and the remaining soil to bedrock must have the same colors as above or any other color that has a chroma 2 or less, or

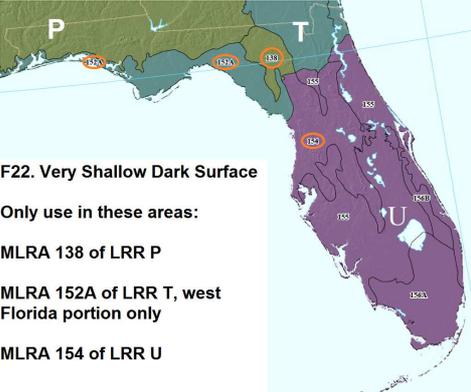
- b) if bedrock occurs within 15 cm (6 inches), more than half of the soil thickness must have value 2.5 or less and chroma 1 or less, and the remaining soil to bedrock must have the same colors as above or any other color that has a chroma 2 or less.



**LRR MAP with MLRAs
 for use with F22 Very Shallow
 Dark Surface**

- LRR P- See MLRA 138
- LRR T- See MLRA 152A
- LRR U- See MLRA 154





F22. Very Shallow Dark Surface

Only use in these areas:

- MLRA 138 of LRR P**
- MLRA 152A of LRR T, west Florida portion only**
- MLRA 154 of LRR U**

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Problem Hydric Soil?##

Has Umbric Surface and Redox Dark Surface

Glistening/sheen shows reduced iron oxidizing as it is exposed to air on the surface of the water in the pit



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Combining HSI

- It is permissible to combine certain hydric soil indicators
- All requirements of the indicators are met except for thickness
- The most restrictive requirements for thickness of layers in any indicators used must be met

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Combining HSI

- Not all indicators are possible candidates for combination
- For example, indicator F2 (Loamy Gleyed Matrix) has no thickness requirement and is not a candidate for combination

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WHERE THE NATURAL SOIL SURFACE HAS BEEN ALTERED BY THE ACTION OF MAN VIA SOIL ADDITION OR REMOVAL, THE INDICATORS MUST BE JUDGED USING NATURAL SOIL SURFACE CRITERIA, ACCOUNTING FOR WHAT WAS ADDED OR REMOVED

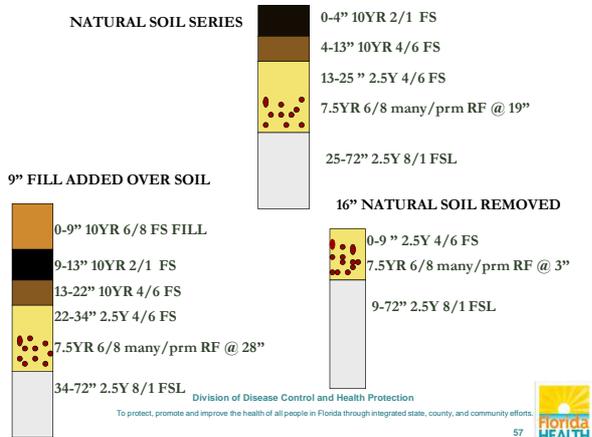
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NATURAL SOIL SERIES

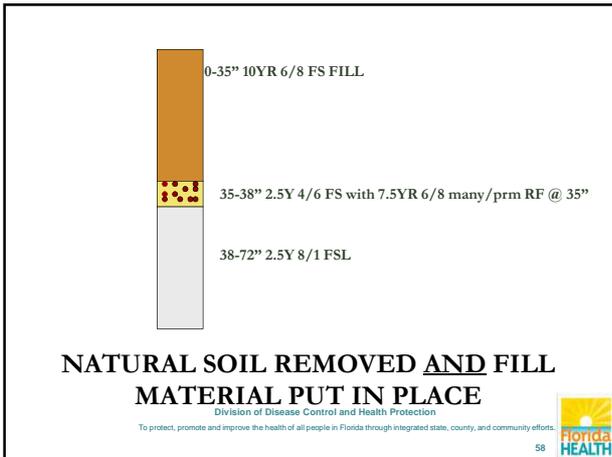
9" FILL ADDED OVER SOIL



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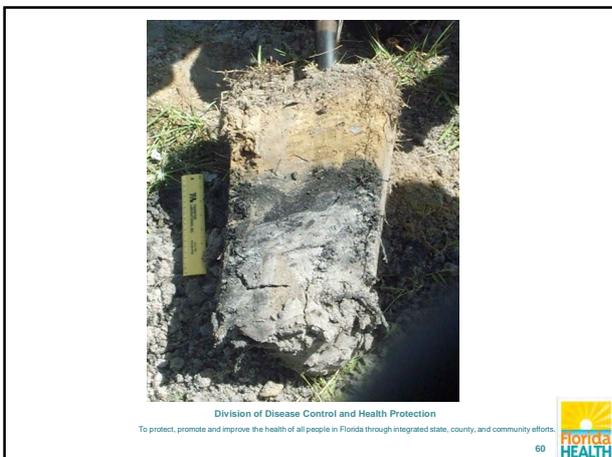


REDOX FEATURES MAY FORM IN FILL MATERIAL AND EXTRA CARE MUST BE TAKEN DURING THEIR EVALUATION

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Soil Pits

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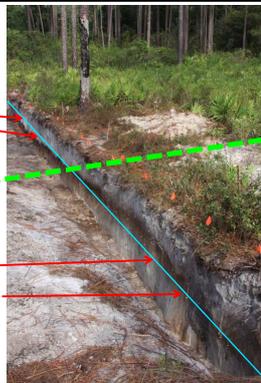
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Stripping

Flatwoods

Sandhill

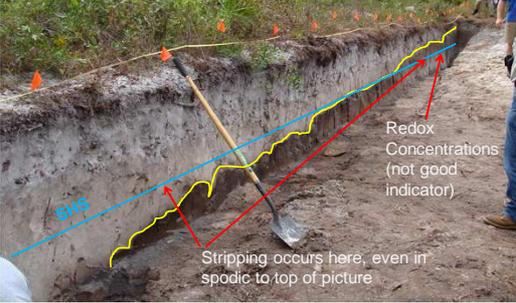
Stripped matrix and
"redox concentrations"
(RC not good indicator
in spodic)



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Redox Concentrations (not good indicator)

Stripping occurs here, even in spodic to top of picture

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THE END

QUESTIONS?



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