**Field Indicators of Hydric Soils in the United States**

**A guide for Identifying and Delineation Hydric Soils,**

**Version 7.0, 2015**

Errata

*Addition on page 4, 4th paragraph, to clarify what to do for value and hue.*

After “It does not have chroma of 2 and would not meet the requirements of any indicator that requires chroma of 2 or less.” Add “Hue and value should be rounded to the nearest color chip when using the indicators. For example, if the color is in between value of 3 and 4 it should be rounded and not excluded from meeting either F3 Depleted Matrix or F6 Redox Dark Surface because it is in between values. If the value is closer to a 3 then F6 or some other dark surface indicator should be considered and if it is closer to 4 then F3 or some other depleted matrix indicator should be considered.”

*Correction on page 5, 2nd paragraph under General Guidance for Using the Indicators. Add indicator F21 to list of indicators that allow chroma 3 deeper than 15 cm (6 inches).*

Replace “All mineral layers above …, except indicators A16, S6, F8, F12, F19, and F20, …” with “All mineral layers above …, except indicators A16, S6, F8, F12, F19, F20, and F21,…”

*On page 6 replace Lenore Vasilas, Chair address with the following:*

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*Correction on page 20, 1st paragraph under Loamy and Clayey Soils. Add indicator F21 to list of indicators that allow chroma 3 deeper than 15 cm (6 inches).*

Replace “All mineral layers above …, except for indicators F8, F12, F19, and F20, …” with “All mineral layers above …, except indicators F8, F12, F19, F20, and F21,…”

*On page 10, add LRR Q to A5.*

Replace “**A5. Stratified Layers.** *…; for testing in LRRs V and Z.” with “***. Stratified Layers.** *…; for testing in LRRs Q, V and Z.*

*On page 12, add LRR Q to A8.*

Replace **“A8. Muck Presence.** *For use in LRRs U, V and Z.” with “***A8. Muck Presence.** *For use in LRRs Q, U, V, and Z.*”

*On page 13, change wording to A11 to clarify that the dark surface must occur within the upper 6 inches and the general allowance of a chroma higher than 2 in less than 15 cm (6 inches) above the indicator can be used for this indicator.*

Replace. “ …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 percent 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.” with “…Sandy layer(s) with value 3 or less and chroma 1 or less and, viewed through a 10x or 15x hand lens, at least 70 percent of the visible particles must be masked with organic material or dark loamy or clayey layer(s) with value 3 or less and chroma 2 or less must occur immediately above the depleted matrix and within 15 cm (6 inches) of the soil surface. In dark sandy layers observed without a hand lens particles appear to be close to 100 percent masked.

*On page 13, change wording to A12 to clarify that the dark surface must occur within the upper 6 inches and the general allowance of a chroma higher than 2 in less than 15 cm (6 inches) above the indicator can be used for this indicator.*

Replace “…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. In any sandy material above the depleted or gleyed matrix, 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 percent masked. with “…Layer(s) starting within 15 cm (6 inches) and above the depleted or gleyed matrix must have value of 2.5 or less and chroma 1 or less and be at least 30 cm (12 inches) thick and any remaining layer(s) above the depleted or gleyed matrix must have value of 3 or less and chroma of 1 or less. . In dark sandy layers observed without a hand lens particles appear to be close to 100 percent masked.

*On page 17, add LRR Q to S5 and S6.*

Replace “**S5. Sandy Redox.** *For use in all LRRs, except for V, W, X, and Y.” with “***S5. Sandy Redox.** *For use in all LRRs, except for Q, V, W, X, and Y.” and “***S6. Stripped Matrix.** *For use in all LRRs, except for V, W, X, and Y.” with “***S6. Stripped Matrix.** *For use in all LRRs, except for Q, V, W, X, and Y.”*

*On page 18, add for use in LRR K, L, M, and Q to S7 and delete for testing in LRR K, L, and M.*

Replace “**S7. Dark Surface.** *For use in LRRs K, L, M, N, P, R, S, T, U, V, and Z; for testing in LRRs K, L, and M.” with “***S7. Dark Surface.** *For use in LRRs K, L, M, N, P, Q, R, S, T, U, V, and Z.”*

*On page 20, add LRR Q to F1.*

Replace “**F1. Loamy Mucky Mineral.** *For use in all LRRs, except for N, R, S, V, W, X, and Y,…” with “***F1. Loamy Mucky Mineral.** *For use in all LRRs, except for N, Q, R, S, V, W, X, and Y,…”*

*On page 20 at the end of the sandy indicators section add new indicator S11.*

**S11. High Chroma Sands.***For use along shorelines and near shore regions of the Great Lakes in LRRs K and L.* In coastal zones and dune-and-swale complexes, a layer 5 cm (2 inches) or more thick starting within 10 cm (4 inches) of the surface with chroma 4 or less and 2% or more distinct or prominent redox concentrations.

**User Notes:** Along the shorelines of the Great Lakes within LRRs L and K, some wetlands exhibit the presence of high chroma sands (often a chroma of 3 or more). These high-chroma, sandy soils occur at the landward edge of coastal marshes, in interdunal landscape positions, and dune-and-swale complexes. These soils exhibit redox concentrations as pore linings and/or soft masses starting within 10 cm. (4 inches) of the surface. In adjacent upland areas, redox concentrations are absent or are only observed below 15 cm (6 inches). It may be helpful to involve a soil scientist or wetland scientist familiar with these soils.

*On page 20 after S11 add new indicator S12.*

**S12. Barrier Islands 1 cm Muck.** *For use in MLRA 153B and 153D of LRR T.* In the swale portion of dune-and- swale complexes of barrier islands, a layer of muck 1 cm (0.5 inch) or more thick with value of 3 or less and chroma of 2 or less and starting within 15 cm (6 inches) of the soil surface.

User notes: This indicator is similar to A9 but allows chroma of greater than 1, but not greater than 2. The indicator is limited to the dune-and-swale complex on barrier islands.

*Correction on page 21 in caption for figure 29.*

Replace “This soil has value 4 or less …” with “This soil matrix has value 4 or more …”

*Correction on page 24 in caption for figure 37.*

Replace “…40 percent value 4 or more and chroma 2 or less,…” with “…40 percent chroma 2 or less,…”

*On page 23 replace* ***F10. Marl*** *indicator and user notes with the following wording change.*

**F10. Marl.***For use in LRRs K, L and U.* A layer of marl with value of 5 or more and chroma less than 2 starting within 10 cm (4 inches) of the soil surface.

**User Notes:** Marl is a limnic material deposited in water by precipitation of CaCO3 by algae as defined in Soil Taxonomy (Soil Survey Staff, 1999). It has a Munsell value of 5 or more and reacts with dilute HCl to evolve CO2. Marl is not the carbonatic substrate material associated with limestone bedrock. Some soils have materials with all of the properties of marl, except for the required Munsell value. These soils are hydric if the required value is present within 10 cm (4 inches) of the soil surface. Normally, this indicator occurs at the soil surface.

*On page 26 replace* ***F19. Piedmont Flood Plain Soils*** *indicator and user notes with the following wording change.*

**F19. Piedmont Flood Plain Soils**. *For use in MLRAs 149A and 148 of LRR S; for testing on flood plains subject to Piedmont deposition throughout LRRs P, S, and T.* On flood plains, a mineral layer at least 15 cm (6 inches) thick, starting within 25cm (10 inches) of the soil surface, with a matrix (60 percent or more of the volume) chroma of less than 4 and 20 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

**User Notes:** This indicator is for use or testing on flood plains in the Mid-Atlantic and Southern Piedmont Provinces and areas where sediments derived from the Piedmont have been deposited on flood plains on the Coastal Plain (fig. 39). This indicator does not apply to stream terraces, which are associated with a previous stream level and are representative of an abandoned flood plain. While these soils are found on flood plains, flooding may be rare and groundwater is often the source of hydrology.

*On page 26 after Figure 40 caption add the following newly approved indicator.*

**F21. Red Parent Material.** *For use in MLRA 145 of LRR R, MLRAs 147 and 148 of LRR S and MLRA 127 of LRR N; for testing in all soils derived from red parent materials.* A layer derived from red parent materials (see glossary) that is at least 10 cm (4 inches) thick, starting within 25 cm (10 inches) of the soil surface with a hue of 7.5YR or redder. The matrix has a value and chroma greater than 2 and less than or equal to 4. The layer must contain 10 percent or more depletions and/or distinct or prominent redox concentrations occurring as soft masses or pore linings. Redox depletions should differ in color by having:

1. Value one or more higher and chroma one or more lower than the matrix, or
2. Value of 4 or more and chroma of 2 or less.

User Notes: This indicator was developed for use in areas of red parent material, such as residuum in the Piedmont Province Triassic lowlands section or the Paleozoic “red beds” of the Appalachian Mountains, and in alluvium or colluvium derived from these materials. In glaciated areas, the indicator may form in glacial till, outwash, deltaic sediments, or glaciolacustrine sediments derived from similar red lithologies. In order to confirm that it is appropriate to apply this indicator to particular soils, soils formed from similar parent materials in the area should have been evaluated to determine their Color Change Propensity Index (CCPI) and be shown to have CCPI values below 30 (Rabenhorst and Parikh, 2000.) It cannot be assumed that sediment overlying red colored bedrock is derived solely from that bedrock. The total percentage of all redox concentrations and redox depletions must add up to at least 10% to meet the threshold for this indicator.

This indicator is typically found at the boundary between hydric and non-hydric soils. Users that encounter a depleted matrix in the upper part should consider F3-Depleted Matrix. F3 is often found in sites that are anaerobic for a longer period. Users that encounter a dark soil surface (value 3 or less and chroma 2 or less) should consider F6-Redox Dark Surface or F7-Depleted Dark Surface. If the site is in a closed depression subject to ponding users should consider F8-Redox Depressions. See glossary for definition of Red Parent Material.

*On page 26 after F21 add the following newly approved indicator.*

**F22. Very Shallow Dark Surface.** *For use in MLRA 138 and West Florida portion of 152A of LRR P and MLRA 154 of LRR U; for testing in all other MLRAs and LRRs.* In depressions and flood plains subject to frequent ponding and/or flooding, one of the following:

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

*On page 28 add the following new test indicator after TS5.*

**TS7. Barrier Islands Low Chroma Matrix.** *For use in MLRA 153B and 153D of LRR T.* In the swale portion of dune-and-swale complexes of barrier islands, a surface layer 1 cm (0.5 inch) or more thick with value 4 or less and chroma 2 or less. Below the dark surface, a layer(s) 10 cm (4 inches) or more thick with a dominant hue of 2.5Y or yellower and value 4 or more and chroma less than 2 starting within 15 cm (6 inches) of the soil surface.

User notes: The requirement of a dark surface layer above the low chroma layer excludes sediments from recent depositional events (especially common in overwash areas) which are not hydric. Low chroma colors in recent deposits are likely due to the nature of the parent material and not related to hydrology. There is no color requirement for any layer(s) between the dark surface and the low chroma matrix. This indicator is limited to sandy soils in the dune-and-swale complex of barrier islands.

*On page 28 delete the following.*

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

**User Notes:** This indicator was developed for use in areas of red parent material, such as Triassic-Jurassic sediments in the Connecticut River Valley, Permian “red beds” in Kansas, clayey red till and associated lacustrine deposits around the Great Lakes, and Jurassic sediments associated with “hogbacks” on the eastern edge of the Rocky Mountains. This indicator also occurs on “Red River” flood plains, such as those along the Chattahoochee, Congaree, Red, and Tennessee Rivers. The most noticeable redox features in red materials are redox depletions and soft manganese masses that are black or dark reddish black (figs. 41 and 42).

*Replace with the following.*

**TF2. Red Parent Material.** This test indicator has been deleted.Its concepts have been approved for use as indicator F21 (Red Parent Material).

*On page 29 delete the following. This test indicator was replaced with F22.*

**TF12. Very Shallow Dark Surface.** *For testing in all LRRs.* In depressions and other concave landforms, one of the following:

a. If bedrock occurs between depths of 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 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 15 cm (6 inches), 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.

*Correction in caption 41 on page 26.*

Replace “Indicator TF2…” with “Indicator F21…”

*Figure 41 and 42 relate to indicator F21 (Red Parent Material) and should be moved to the section for loamy and clayey indicators near F21.*

*Correction on page 34 in caption for Figure 45.*

Replace “… two redox concentrations…” with “…2% or more redox concentrations…”

*On page 36 add the following definition.*

**flood plain** - The nearly level plain that borders a stream and is subject to inundation under flood-stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of the streams.

*Add the below figure between figure 48 and 49 on page 36.*

|  |  |  |
| --- | --- | --- |
| Upper Threshold for Faint | | |
| Δ Hue | Δ Value | Δ Chroma |
| 0 | ≤2 | ≤1 |
| 1 | ≤1 | ≤1 |
| 2 | 0 | 0 |
| Hue | Value | Chroma |
| Any | ≤3 | ≤2 |

Figure 48.5.—Any feature above the upper threshold

for faint features would be considered either distinct

or prominent. If an indicator requires distinct or

prominent features then those features at or below t

he faint threshold do not count.

*On page 40 add the following definition.*

**stream terrace** - One, or a series of flat-topped landforms in a stream valley that flank and are parallel to the stream channel, originally formed by a previous stream level, and representing remnants of an abandoned flood plain, stream bed, or valley floor produced during a past state of fluvial erosion or deposition (i.e., currently very rarely or never flooded; inactive cut and fill and/or scour and fill processes). Erosional surfaces cut into bedrock and thinly mantled with stream deposits (alluvium) are called "strath terraces." Remnants of constructional valley floors thickly mantled with alluvium are called alluvial terraces.

*Additions on p. 43, Appendix 1.*

Add S12 for use in MLRA 153B and 153D of LRR T.

Add F21 for use in MLRA 145 of LRR R, MLRA 147 and 148 of LRR S and MLRA 127 of LRR N.

Add F22 for use in MLRA 138 and West Florida portion of 152A of LRR P and MLRA 154 of LRR U.

Add a row “Q A1, A2, A3, A4, A8, A11, A12, S1, S4, S7, F2, F3, F6, F7, F8”

*Deletions on p. 44, Appendix 2.*

Delete TF2 from LRRs G, H, K, L, N, P, R, S, T, V, and Z.

Delete TF12 for all LRRs.

Add F22 to all LRRs except P and U. In LRR P add F22 (except MLRA 138 and West Florida portion of 152A). In LRR U add F22 (except MLRA 154).

Add a row “Q A5, F22, TF2”

Add TS7 to MLRA 153B and 153D of LRR T.