

# Major Land Resource Area 111X Indiana and Ohio Till Plain

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## Ecological site keys

### 111A\_ES\_KEY

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#### 1a. Organic parent material

2a. Underlying material is mineral [Mineral Muck Prairie] ... R111XA001IN – Mineral Muck

#### 2b. Underlying material is organic

3a. Underlying material is limnic [Mucky Prairie] ... R111XA002IN – Limnic Muck

3b. Underlying material is not limnic [Deep Muck Wetland] ... R111XA003IN – Deep Muck

#### 1b. Non-organic parent material

#### 4a. Active floodplain, alluvium parent material

5a. Soils are very poorly to somewhat poorly drained [Floodplain Forest] ... F111XA004IN – Wet Alluvium

5b. Soils are moderately well or well drained [Dry Floodplain Forest] ... F111XA005IN – Dry Alluvium

#### 4b. Other landforms, not in floodplain, non-alluvium parent material

#### 5a. Residuum of weathering bedrock

#### 6a. Depth to restrictive layer is less than 100 cm (40 inches)

7a. Depth to restrictive layer is less than 50 cm (20 inches) [Shallow Restricted woodland] ... F111XA018IN – Shallow Restricted

7b. Depth to restrictive layer is between 50 and 100 cm (20 and 40 inches) [Mixed Forest] ... F111XA019IN – Moderately Deep Restricted

6b. Depth to restrictive layer is greater than 100 cm (40 inches) [Mesic Forest] ... F111XA020IN – Deep Restricted

#### 5b. Unconsolidated deposits

#### 8a. Ice-transported unstratified deposits (glacial till)

#### 9a. Site is located in a depression landscape position

10a. Soil Munsell surface color is lighter than 3/2 and/or an alfisol; no ponding [Mesic Forest] ... F111XA006IN – Till Depression

10b. Soil Munsell surface color is 3/2 or darker and/or a mollisol; occasional to frequent ponding [Till Flatwood] ... F111XA007IN – Till Depression Flatwood

#### 9b. Site is located in a swell (convex) landscape position

11a. Soil Munsell surface color is lighter than 3/2

- 12a. Soils are poorly or somewhat poorly drained [Till Mesic Forest] ... F111XA008IN – Wet Till Ridge
- 12b. Soils are moderately well or well drained [Till Ridge Forest] ... F111XA009IN – Till Ridge
- 11b. Soil Munsell surface color is 3/2 or darker and/or a mollisol [Till Mesic Prairie] ... R111XA010IN – Till Ridge Prairie
- 8b. Non-ice-transported stratified deposits (wind and water deposits)
  - 13a. Water-transported deposits (lacustrine and outwash)
    - 14a. Deposited in non-flowing water, lacustrine parent material
      - 15a. Soils are poorly or somewhat poorly drained [Flatwood Forest] ... F111XA011IN – Wet Lacustrine Forest
      - 15b. Soils are somewhat poorly to well drained [Mesic Forest] ... F111XA012IN – Lacustrine Forest
    - 14b. Deposited in flowing water, outwash parent material
      - 16a. Soil Munsell surface color is lighter than 3/2
        - 17a. Soils are somewhat poorly or moderately well drained [Outwash Forest] ... F111XA014IN – Outwash Upland
        - 17b. Soils are well to excessively drained [Oak-Hickory Forest] ... F111XA015IN – Dry Outwash Upland
      - 16b. Soil Munsell surface color is darker than 3/2
        - 18a. Soils are very poorly to somewhat poorly drained [Wet prairie] ... R111XA016IN – Outwash Mollisol
        - 18b. Soils are moderately well to excessively drained [Tallgrass Prairie] ... R111XA017IN – Dry Outwash Mollisol
  - 13b. Wind-transported or sandy deposits (Loess, Sandy Deposits)
    - 19a. Wind-transported silt, loess parent material [Flatwood Forest] ... F111XA013IN – Loess Upland
    - 19b. Sandy parent material
      - 20a. Site is located on an interdunal landscape position [Oak Woodland-Prairie] ... F111XA021IN – Sandy Interdune
      - 20b. Site is located on a dune landscape position [Dry Sand Savanna] ... R111XA022IN – Sand Dune

## 111B\_ES\_KEY

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### 1a. Organic parent material

- 2a. Underlying material is mineral ... R111XB001IN – Mineral Muck

**2b. Underlying material is organic**

**3a. Underlying material is limnic** ... R111XB002IN – Limnic Muck

**3b. Underlying material is not limnic and/or greater than 75 cm (30 inches) from the surface** ... R111XB003IN – Deep Muck

**1b. Non-organic parent material**

**4a. Active floodplain, alluvium parent material**

**5a. Soil Surface dark in color (3/2 Munsell or darker)**

**6a. Soils are in the aquic taxonomic suborder** ... F111XB201IN – Wet Alluvium Floodplain

**6b. Soils are not in the aquic taxonomic suborder** ... F111XB202IN – Dry Alluvium Floodplain

**5b. Soil surface light in color (lighter than 3/2 Munsell)**

**7a. Soils are very poorly to somewhat poorly drained** ... F111XB203IN – Wet Alluvium Forest

**7b. Soils are moderately well or well drained** ... F111XB204IN – Dry Alluvium Forest

**4b. Other landforms, not in floodplain, non-alluvium parent material**

**8a. Residuum of weathering bedrock**

**9a. Soil surface dark in color 3/2 Munsell or darker** ... R111XB301IN – Dark Bedrock Prairie

**9b. Soil surface light in color (lighter than 3/2 Munsell)**

**10a. Soils are poorly or somewhat poorly drained** ... F111XB302IN – Mesic Bedrock Forest

**10b. Soils are moderately well drained or drier** ... F111XB303IN – Dry Bedrock Forest

**8b. Unconsolidated deposits**

**11a. Ice-transported unstratified deposits (glacial till)**

**12a. Site is on a concave landscape position and/or very poorly or poorly drained** ... F111XB501IN – Till Depression

**12b. Site is on a convex landscape position**

**13a. Soils are somewhat poorly drained** ... F111XB502IN – Wet Till Ridge

**13b. Soils are moderately well or well drained**

**11b. Non-ice-transported stratified deposits (water deposits)**

**14a. Deposited in non-flowing water, lacustrine parent material**

**15a. Soils are very poorly or poorly drained** ... F111XB101IN – Lacustrine Flatwood

**15b. Soils are somewhat poorly or moderately well drained** ... F111XB102IN – Lacustrine Forest

**14b. Deposited in flowing water, outwash parent material**

**16a. Soil surface dark in color 3/2 Munsell or darker**

**17a. Soils are in the aquic suborder and/or very poorly or poorly drained** ... R111XB401IN – Wet Outwash Mollisol

**17b. Soils are not in the aquic suborder and/or they are SWPD or drier** ... R111XB402IN – Dry Outwash Integrade

**16b. Soil surface light in color lighter than 3/2 Munsell**

**18a. Soils are very poorly to somewhat poorly drained** ... F111XB403IN – Outwash Upland

## 111C\_ES\_KEY

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### 1a. Organic parent material

2a. Underlying material is mineral [mineral muck prairie] ... R111XC012IN – Mineral Muck

### 2b. Underlying material is organic

3a. Underlying material is limnic [mucky prairie] ... R111XC011IN – Limnic Muck

3b. Underlying material is not limnic [deep muck wetland] ... R111XC013IN – Deep Muck

### 1b. Non-organic parent material

#### 4a. Active floodplain, alluvium parent material

5a. Soils are very poorly to somewhat poorly drained [floodplain forest] ... F111XC014IN – Wet Floodplain

5b. Soils are moderately well or well drained [dry floodplain forest] ... F111XC015IN – Dry Floodplain

#### 4b. Other landforms, not in floodplain, non-alluvium parent material

##### 6a. Ice-transported unstratified deposits (glacial till)

7a. Site is located in a depression landscape position [wet prairie] ... R111XC005IN – Glacial Depression

##### 7b. Site is located in a swell (convex) landscape position

8a. Soil Munsell surface color is lighter than 3/2, and slope generally greater than 4% [till mesic woodland] ...  
F111XC007IN – Glacial Ridge

8b. Soil Munsell surface color is 3/2 or darker and/or a mollisol, and slope usually less than or equal to 4% [till mesic prairie] ... R111XC006IN – Flat Glacial Ridge

##### 6b. Non-ice-transported stratified deposits (wind and water deposits)

##### 9a. Water-transported deposits (outwash)

###### 10a. Site is located in a depression landscape position

11a. Site is hydric (poorly drained and very poorly drained) [wet prairie] ... R111XC008IN – Wet  
Overflow

11b. Site is non-hydric (moderately well drained and somewhat poorly drained) [outwash forest] ...  
F111XC009IN – Overflow

10b. Site is located in a swell (convex) landscape position [tallgrass savanna] ... R111XC010IN – Well Drained  
Overflow

##### 9b. Wind-transported or sandy deposits (dunes)

###### 12a. Site is located on an interdunal landscape position

13a. Site is hydric (poorly drained and very poorly drained) [wet sand prairie] ... R111XC002IN – Wet  
Sandy Interdune

13b. Site is non-hydric (moderately well drained and somewhat poorly drained) [oak woodland] ...  
F111XC003IN – Sandy Interdune

12b. Site is located on a dune landscape position [dry sand savanna] ... R111XC001IN – Sand Dune

## 111D\_ES\_KEY

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### 1a. Organic parent material

2a. organic material depth less than 130 cm (51 inches) [Muck Prairie] ... R111XD001IN – Shallow Muck

2b. organic material depth 130 cm (51 inches) or greater [Deep Muck] ... R111XD002IN – Deep Muck

### 1b. Non-organic parent material

#### 3a. Active floodplain, alluvium parent material

4a. Soils are very poorly to somewhat poorly drained [Floodplain Forest] ... F111XD003IN – Wet Alluvium

4b. Soils are moderately well or well drained [Dry Floodplain Forest] ... F111XD004IN – Dry Alluvium

#### 3b. Other landforms, not in floodplain, non-alluvium parent material

##### 5a. Residuum of weathering bedrock

###### 6a. Depth to restrictive layer is less than 100 cm (40 inches)

7a. Depth to restrictive layer is less than 50 cm (20 inches) [Shallow Restricted woodland] ... F111XD022IN – Shallow Restricted

7b. Depth to restrictive layer is between 50 and 100 cm (20 and 40 inches) [Mixed Forest] ... F111XD023IN – Moderately Deep Restricted

6b. Depth to restrictive layer is greater than 100 cm (40 inches) [Mesic Forest] ... F111XD024IN – Deep Restricted

##### 5b. Unconsolidated deposits

###### 8a. Ice-transported unstratified deposits (glacial till)

###### 9a. Site is located in a concave landscape position

10a. Soil Munsell surface color is lighter than 3/2 and/or an alfisol [Mesic Forest] ... F111XD005IN – Till Depression

###### 10b. Soil Munsell surface color is 3/2 or darker

11a. Soil Surface color is less than 25 cm (10 inches) deep [Tall-Grass Savanna] ... R111XD006IN – Mollic Till Depression

###### 11a. Soil Surface color is 25 cm (10 inches) or deeper

12a. Soils are well drained [Till Prairie] ... R111XD007IN – Till Depression Prairie

12b. Soils are very poorly or poorly drained [Till Flatwood] ... F111XD008IN – Till Depression Flatwood

###### 9b. Site is located in a convex landscape position

13a. Soil Munsell surface color is lighter than 3/2

14a. Soils are poorly or somewhat poorly drained [Till Mesic Forest] ... F111XD009IN – Wet Till Ridge

14b. Soils are moderately well or well drained [Till Ridge Forest] ... F111XD010IN – Till Ridge

13b. Soil Munsell surface color is 3/2 or darker

15a. Soil surface color is less than 25 cm (10 inches) deep [Savanna] ... R111XD011IN – Mollic Till Ridge

15b. Soil surface color is 25 cm (10 inches) or deeper [Till Mesic Prairie] ... R111XD012IN – Till Ridge Prairie

8b. Non-ice-transported stratified deposits (wind and water deposits)

16a. Water-transported deposits (lacustrine and outwash)

17a. Deposited in non-flowing water, lacustrine parent material

18a. Soils are very poorly or poorly drained [Flatwood Forest] ... F111XD013IN – Wet Lacustrine Forest

18b. Soils are somewhat poorly or moderately well drained [Mesic Forest] ... F111XD014IN – Lacustrine Forest

17b. Deposited in flowing water, outwash parent material

19a. Soil surface color is lighter than 3/2

20a. Soils are somewhat poorly or moderately well drained [Outwash Forest] ... F111XD017IN – Outwash Upland

20b. Soils are well to excessively drained [Oak-Hickory Forest] ... F111XD018IN – Dry Outwash Upland

19b. Soil surface color is darker than 3/2

21a. Surface color is less than 25 cm (10 inches) deep [Savanna] ... R111XD019IN – Outwash Integrate

21b. Surface color is 25 cm (10 inches) or deeper

22a. Soils are very poorly to somewhat poorly drained [Wet prairie] ... R111XD020IN – Wet Outwash Mollisol

22b. Soils are moderately well to excessively well drained [Tallgrass Prairie] ... R111XD021IN – Dry Outwash Mollisol

16b. Wind-transported or sandy deposits (Loess, Sandy Deposits)

23a. Wind-transported silt, loess parent material

24a. Soils are very poorly or poorly drained and/or are a mollisol [Flatwood Forest] ... F111XD015IN – Wet Loess Upland

24b. Soils are somewhat poorly to well drained and/or are an alfisol [Loess Forest] ... F111XD016IN – Dry Loess Upland

23b. Sandy parent material

25a. Site is located on an interdunal landscape position [Oak Woodland-Prairie] ... F111XD025IN – Sandy Interdune

25b. Site is located on a dune landscape position

26a. Soil surface color is 3/2 or darker to a depth of 25 cm (10 inches) or greater [Sand Dune Prairie] ... R111XD026IN – Sand Dune Prairie

26b. Soil surface is lighter than that 3/2 munsell or less than 25 cm (10 inches) [Dry Sand Savanna] ... R111XD027IN – Sand Dune

## 111E\_ES\_KEY

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### 1a. Organic parent material

2a. Underlying material is mineral [big bluestem -switchgrass] ... R111XE001OH – Mineral Muck

2b. Underlying material is organic

3a. Underlying material is limnic (coprogenous earth) [big bluestem - eastern gamagrass??] ... R111XE002OH – Limnic Muck

3b. Underlying material is not limnic [bulrush - cattail] ... R111XE003OH – Deep Muck

### 1b. Non-organic parent material

4a. Active floodplain, alluvium parent material

5a. Soil surface dark in color (3/2 Munsell or darker)

6a. Soils are very poorly drained [cottonwood - sycamore] ... F111XE201OH – Wet Alluvium Floodplain

6b. Soils are moderately well to well drained [Ohio buckeye - red maple] ... F111XE202OH – Dry Alluvium Floodplain

5b. Soil surface light in color (lighter than 3/2 Munsell)

7a. Soils are poorly to somewhat poorly drained [silver maple - swamp white oak] ... F111XE203OH – Wet Alluvium Forest

7b. Soils are moderately well to well drained [sugar maple - American basswood] ... F111XE204OH – Dry Alluvium Forest

4b. Other landforms, not in floodplain, non-alluvium parent material

8a. Residuum of weathering bedrock

9a. Soils are somewhat poorly drained [sugar maple - American beech] ... F111XE301OH – Wet Restricted

9b. Soils are moderately well to well drained [white oak - red oak] ... F111XE302OH – Dry Restricted

8b. Unconsolidated deposits

10a. Ice-transported unstratified deposits (glacial till)

11a. Site is on a concave landscape position (toeslope and/or footslope) AND frequently ponded [pin oak -swamp white oak] ... F111XE501OH – Till Depression

**11b. site is on a convex landscape position (summit, shoulder, backslope)**

**12a. Soils are somewhat poorly drained [sugar maple - American beech] ... F111XE502OH – Wet Till Ridge**

**12b. Soils are moderately well to well drained [sugar maple - American beech] ... F111XE503OH – Till Ridge**

**10b. Non-ice-transported stratified deposits**

**13a. Deposited in non-flowing water, lacustrine parent material**

**14a. Soils are very poorly or poorly drained [pin oak - swamp white oak] ... F111XE101OH – Lacustrine Flatwood**

**14b. Soils are somewhat poorly drained or drier [sugar maple - American beech] ... F111XE102OH – Lacustrine Forest**

**13b. Deposited in flowing water, outwash-colluvium parent material**

**15a. Soil surface dark in color (3/2 Munsell or darker)**

**16a. Soils are very poorly or poorly drained [prairie cordgrass - big bluestem] ... R111XE401OH – Wet Outwash Mollisol**

**16b. Soils are somewhat poorly drained or drier [white oak - bur oak / little bluestem - big bluestem] ... R111XE402OH – Dry Outwash Mollisol**

**15b. Soil surface light in color (lighter than 3/2 Munsell)**

**17a. Soils are very poorly, poorly or somewhat poorly drained [sugar maple - red oak] ... F111XE403OH – Outwash Upland**

**17b. Soils are moderately well drained or drier [oaks / prairie understory] ... F111XE404OH – Dry Outwash Upland**

## 111A Outline

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### I. Organic PM

**A. Underlying material is mineral ... R111XA001IN – Mineral Muck**

**B. Underlying material is organic**

**i. Underlying material is limnic ... R111XA002IN – Limnic Muck**

**ii. Underlying material is not limnic ... R111XA003IN – Deep Muck**

### II. Non-Organic PM

**A. Alluvium PM**

**i. Soils are very poorly to somewhat poorly drained ... F111XA004IN – Wet Alluvium**

**ii. Soils are moderately well or well drained ... F111XA005IN – Dry Alluvium**

**B. Glacial till PM**

- i. Site is located in a depression landscape position
    - a. Soil surface color (SC) is lighter than 3/2 and/or an alfisol; no ponding ... F111XA006IN – Till Depression
    - b. Soil SC is 3/2 or darker and/or a mollisol; occasional to frequent ponding ... F111XA007IN – Till Depression  
Flatwood
  - ii. Site is located in a swell (concave) landscape position
    - a. Soil surface is lighter than 3/2
      - Soils are poorly or somewhat poorly drained ... F111XA008IN – Wet Till Ridge
      - Soils are moderately well or well drained ... F111XA009IN – Till Ridge
    - b. Soil surface color is 3/2 or darker and/or a mollisol ... R111XA010IN – Till Ridge Prairie
- C. Lacustrine PM**
- i. Soils are poorly or somewhat poorly drained ... F111XA011IN – Wet Lacustrine Forest
  - ii. Soils are somewhat poorly to well drained ... F111XA012IN – Lacustrine Forest
- D. Loess PM ... F111XA013IN – Loess Upland**
- E. Outwash PM**
- i. Soils surface color is lighter than 3/2
    - a. Soils are somewhat poorly or moderately well drained .F111AY014IN
    - b. Soils are well to excessively drained ... F111XA015IN – Dry Outwash Upland
  - ii. Soils surface color is darker than 3/2
    - a. Soils are very poorly to somewhat poorly drained ... R111XA016IN – Outwash Mollisol
    - b. Soils are moderately well to excessively drained ... R111XA017IN – Dry Outwash Mollisol
- F. Residuum PM**
- i. Depth to restrictive layer is less than 20 inches ... F111XA018IN – Shallow Restricted
  - ii. Depth to restrictive layer is between 20 and 40 inches ... F111XA019IN – Moderately Deep Restricted
  - iii. Depth to restrictive layer is greater than 40 inches ... F111XA020IN – Deep Restricted
- G. Sand PM**
- i. Site is located on an interdunal landscape position ... F111XA021IN – Sandy Interdune
  - ii. Site is located on a dune landscape position ... R111XA022IN – Sand Dune

## 111B Outline

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### I. Organic PM

- A. Underlying material is mineral ... R111XB001IN – Mineral Muck
- B. Underlying material is organic
  - i. Underlying material is limnic ... R111XB002IN – Limnic Muck
  - ii. Underlying material is not limnic and/or greater than 30 inches from the surface ... R111XB003IN – Deep Muck

## II. Mineral PM

### A. Lacustrine Parent Material

- i. Soils are very poorly or poorly drained ... F111XB101IN – Lacustrine Flatwood
- ii. Soils are somewhat poorly or moderately well drained ... F111XB102IN – Lacustrine Forest

### B. Alluvium Parent Material

- i. Soil Surface dark in color (3/2 Munsell or darker)
  - a. Soils are in the aquic taxonomic suborder ... F111XB201IN – Wet Alluvium Floodplain
  - b. Soils are not in the aquic taxonomic suborder ... F111XB202IN – Dry Alluvium Floodplain
- ii. Soil surface light in color (lighter than 3/2 Munsell)
  - Soils are very poorly to somewhat poorly drained ... F111XB203IN – Wet Alluvium Forest
  - Soils are moderately well or well drained ... F111XB204IN – Dry Alluvium Forest

### C. Bedrock Parent Material

- i. Soil surface dark in color 3/2 Munsell or darker ... R111XB301IN – Dark Bedrock Prairie
- ii. Soil surface light in color (lighter than 3/2 Munsell)
  - a. Soils are poorly or somewhat poorly drained ... F111XB302IN – Mesic Bedrock Forest
  - b. Soils are moderately well drained or drier ... F111XB303IN – Dry Bedrock Forest

### D. Outwash Parent Material

- i. Soil surface dark in color 3/2 Munsell or darker
  - a. Soils are in the aquic suborder and/or very poorly or poorly drained ... R111XB401IN – Wet Outwash Mollisol
  - b. Soils are not in the aquic suborder and/or they are SWPD or drier ... R111XB402IN – Dry Outwash Integrate
- ii. Soil surface light in color lighter than 3/2 Munsell
  - a. Soils are very poorly to somewhat poorly drained ... F111XB403IN – Outwash Upland
  - b. Soils are moderately well drained or drier ... F111XB404IN – Dry Outwash Upland

### E. Glacial Till Parent Material

- i. Site is on a concave landscape position and/or very poorly or poorly drained ... F111XB501IN – Till Depression
- ii. Site is on a convex landscape position
  - a. Soils are somewhat poorly drained ... F111XB502IN – Wet Till Ridge
  - b. Soils are moderately well or well drained ... F111XE503IN – Till Ridge

## 111D Outline

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### I. Organic PM

- A. organic material depth less than 51 inches ... R111XD001IN – Shallow Muck

**B. organic material depth 51 inches or greater ... R111XD002IN – Deep Muck**

**II. Mineral PM**

**A. Alluvium PM**

**A. Soils are very poorly to somewhat poorly drained ... F111XD003IN – Wet Alluvium**

**B. Soils are moderately well to excessively drained ... F111XD004IN – Dry Alluvium**

**B. Glacial Till**

**A. Site is located in a concave landscape position**

**i. Soil surface color is lighter than 3/2 and/or an alfisol ... F111XD005IN – Till Depression**

**ii. Soil surface color is 3/2 Munsell or darker**

**a. Soil Surface color is less than 10 inches deep ... R111XD006IN – Mollic Till Depression**

**b. Soil surface color is 10 inches or deeper**

**1) Soils are well drained ... R111XD007IN – Till Depression Prairie**

**2) Soils are very poorly or poorly drained ... F111XD008IN – Till Depression Flatwood**

**B. Site is located in a convex landscape position**

**i. Soil surface color is lighter than 3/2**

**a. Soil is poorly or somewhat poorly drained ... F111XD009IN – Wet Till Ridge**

**b. Soil is moderately well or well drained ... F111XD010IN – Till Ridge**

**ii. Soil surface color is 3/2 or darker**

**a. Soil surface color is less than 10 inches deep ... R111XD011IN – Mollic Till Ridge**

**b. Soil surface color is 10 inches or deeper ... R111XD012IN – Till Ridge Prairie**

**C. Lacustrine PM**

**A. Soils are very poorly or poorly drained ... F111XD013IN – Wet Lacustrine Forest**

**B. Soils are somewhat poorly or moderately well drained Lacustrine Forest ... F111XD014IN – Lacustrine Forest**

**D. Loess PM**

**A. Soils are very poorly or poorly drained and/or are a mollisol ... F111XD015IN – Wet Loess Upland**

**B. Soils are somewhat poorly to well drained and/or are an alfisol ... F111XD016IN – Dry Loess Upland**

**E. Outwash PM**

**A. Soil surface color is lighter than 3/2**

**i. Soils are somewhat poorly or moderately well drained ... F111XD017IN – Outwash Upland**

**ii. Soils are well to excessively drained ... F111XD018IN – Dry Outwash Upland**

**B. Soil surface color is darker than 3/2**

**i. Surface color is less than 10 inches deep ... R111XD019IN – Outwash Integrate**

**ii. Surface color is 10 inches or deeper**

**1) Soils are very poorly to somewhat poorly drained ... R111XD020IN – Wet Outwash Mollisol**

**2) Soils are moderately well to excessively well drained ... R111XD021IN – Dry Outwash Mollisol**

**F. Residuum PM**

**A. Depth to restrictive layer is less than 20 inches ... F111XD022IN – Shallow Restricted**

B. Depth to restrictive layer is between 20 and 40 inches ... F111XD023IN – Moderately Deep Restricted

C. Depth to restrictive layer is greater than 40 inches ... F111XD024IN – Deep Restricted

**G. Sand PM**

A. Site is located on an interdunal landscape position ... F111XD025IN – Sandy Interdune

B. Site is located on a dune landscape position

i. Soil surface color is 3/2 or darker to a depth of 10 inches or greater ... R111XD026IN – Sand Dune Prairie

ii. Soil surface is lighter than that 3/2 munsell ... R111XD027IN – Sand Dune

## 111E Outline

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### I. Organic Parent Material

A. Underlying material is mineral ... R111XE0010H – Mineral Muck

B. Underlying material is organic

1 Underlying material is limnic (coprogenous earth) ... R111XE0020H – Limnic Muck

2 Underlying material is not limnic ... R111XE0030H – Deep Muck

### II. Non-Organic/Mineral Parent Material

A. Lacustrine Parent Material

1 Soils are very poorly or poorly drained ... F111XE1010H – Lacustrine Flatwood

2 Soils are somewhat poorly drained or drier ... F111XE1020H – Lacustrine Forest

B. Alluvium Parent Material

1 Soil surface dark in color (3/2 Munsell or darker)

i. Soils are very poorly drained ... F111XE2010H – Wet Alluvium Floodplain

ii. Soils are moderately well to well drained ... F111XE2020H – Dry Alluvium Floodplain

2 Soil surface light in color (lighter than 3/2 Munsell)

i. Soils are poorly to somewhat poorly drained ... F111XE2030H – Wet Alluvium Forest

ii. Soils are moderately well to well drained ... F111XE2040H – Dry Alluvium Forest

C. Residuum Parent Material

1 Soils are somewhat poorly drained ... F111XE3010H – Wet Restricted

2 Soils are moderately well to well drained ... F111XE3020H – Dry Restricted

D. Outwash-Colluvium Parent Material

1 Soil surface dark in color (3/2 Munsell or darker)

i. Soils are very poorly or poorly drained ... R111XE4010H – Wet Outwash Mollisol

ii. Soils are somewhat poorly drained or drier ... R111XE4020H – Dry Outwash Mollisol

2 Soil surface light in color (lighter than 3/2 Munsell)

i. Soils are very poorly, poorly or somewhat poorly drained ... F111XE4030H – Outwash Upland

ii. Soils are moderately well drained or drier ... F111XE4040H – Dry Outwash Upland

**E. Glacial Till Parent Material**

**1 Site is on a concave landscape position (toeslope and/or footslope) AND frequently ponded ... F111XE5010H – Till Depression**

**2 site is on a convex landscape position (summit, shoulder, backslope)**

i. Soils are somewhat poorly drained ... F111XE5020H – Wet Till Ridge

ii. Soils are moderately well to well drained ... F111XE5030H – Till Ridge