OUTLINE FOR EARL STEPHEN'S ORIGINAL THESIS

Note: This version was rejected by Hugh Raup as too lengthy. Many sections of that handwritten draft which Raup rejected are in the Archives. Marginal notes "delete," "not necessary," "too wordy," confirm Raup's opinion. [DRF discussion with Raup]

January 3, 1955

Introduction

I. Considerations in selecting the site of the investigation: the reconstruction of the general land-use history of a forested area.
   A. Introductions to the primeval landscape.
      1. Stone walls, stone piles, rail and wire fences.
      2. Cellar holes and building remains
      3. Introduced plants.
   B. Modifications of the primeval landscape.
      1. Ages of the tree boles.
      2. Ages of sprout clumps.
      3. Origins of the trees.
      4. Dead stumps and dead tree boles.
      5. Mounds and pits of uprooted trees.
      6. Old-field forest stands.
      7. Tree and forest forms.
      8. Stand composition.
      9. Plowing.
II. Construction of the 10-foot grid.
III. Belt transect of woody shrub and herbaceous ground cover.
IV. Small trees-less than 1½" d.b.h.i.b.
   A. Distribution.
   B. Composition.
   C. Origins and ages.
   D. Number of generations on each clone.

E. Height growth.

F. Other characteristics.

V. Dead stumps, dead trees, and wood fragments.

A. Distribution.

B. Field identification of stumps.

C. Ages of the dead stumps, dead trees and wood fragments.

D. The origins and number of generations.

E. Considerations in determining how long the stumps and trees had been dead and why they were dead.

F. Miscellaneous.

1. Locality.
2. Organic accumulation and degree of leaching.
3. Presence or absence of charcoal.
4. Soil consistence.
5. Tree form.
6. Crown classification.
7. Relationship of trees represented by stumps and current stand.

VI. Live trees.

A. Distribution.

B. Field identification of stumps.

C. Ages of the dead stumps, dead trees and wood fragments.

D. The origins and number of generations.

E. Considerations in determining how long the stumps and trees had been dead and why they were dead.

F. Miscellaneous.

1. Locality.
2. Organic accumulation and degree of leaching.
3. Presence or absence of charcoal.
4. Soil consistence.
5. Tree form.
6. Crown classification.

7. Relationship of trees represented by stumps and current stand.

VII. Construction of the 6-inch contour map.

VIII. Construction of boulder distribution map.

IX. Construction of canopy map.

X. The mounds and pits of uprooted trees:

A. Preliminary survey of the mounds and pits of uprooted trees: The determination of the origins of the elevations and depressions on the forest floor from their gross characteristics.

1. Gross characteristics of mounds and pits of uprooted trees: no excavation required except that which can be done with the hands alone.
    a. Form.
    b. The occurrence of mound and pit pairs
    c. Orientation of the mounds and pits.
    d. Trees growing on mounds.
    e. The depth of organic accumulations on the surfaces of uprooting mounds and pits, and its degree of incorporation with the mineral soil components.
    f. Consistence and texture of the soil.
    g. The presence of prostrate tree boles.
2. Gross characteristics of elevations due to boulders immediately below the surface of the forest floor.
3. Gross characteristics of elevations around the bases of large trees due to root growth.
4. Gross characteristics of elevations and depressions due to tree stumps in various stages of decomposition.
5. Gross characteristics of elevations due to prostrate tree boles or parts thereof.

B. Final survey of mounds and pits of uprooted trees: The documentation of their origin, the determination of the species of trees that were uprooted, the collection of buried charcoal and pollen and the description of their soil profiles:

1. The morphology and gross anatomy of mounds and pits of uprooted trees.
    a. Mound and pit No. 1.
        i. Morphological features.

ii. Gross anatomical features.

iii. Morphological and gross anatomical features that are of diagnostic value for relative age determination; No chemical or physical analyses required for their observation.

b. Mound and pit No. 35.

i. Morphological features.

ii. Gross anatomical features.

iii. Morphological and gross anatomical features that are of diagnostic value for relative age determination; No chemical or physical analyses required for their observation.

c. Mound and pit No. 17.

i. Morphological features.

ii. Gross anatomical features.

iii. Morphological and gross anatomical features that are of diagnostic value for relative age determination; No chemical or physical analyses required for their observation.

d. Mound and pit No 4.

i. Morphological features.

ii. Gross anatomical features.

iii. Morphological and gross anatomical features that are of diagnostic value for relative age determination; No chemical or physical analyses required for their observation.

e. Mound and pit No. 25.

f. Mound and pit "C".

g. Mound and pit “B”.

h. Mound and pit “A”.

2. The developmental morphology and anatomy of mounds and pits of uprooted trees.

3. The determination of the relative ages of the mounds and pits.

4. The determination of the species of the trees that were uprooted.

XI. The sectioning of the live trees 1½” in d.b.h.i.b. and larger: Stem analyses for radial

and height growth reconstruction.

XII. Reconstruction of the developmental trends of the forest stand final synthesis.

1. Composition:
    a. 1635
    b. 1733
    c. 1803
    d. 1815
    e. 1854
    f. 1890
    g. 1915
    h. 1935
    i. 1938
    j. 1952

Source: Earl Stephens, from Harvard Forest 1955-4, Folder 1.