BIOTIC TYPE MAPPING OF OKLAHOMA WATERSHEDS

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During the period 1936-40 the author participated[1] in the mapping of the natural vegetation, or biotic, types on ten complete or partial watersheds in Oklahoma, totaling approximately 1,668,640 acres, and recorded on a reconnaissance scale the predominant types along 3,100 miles of highway incidental to travel between various points in the state.

This work was done in connection with soil conservation activities in demonstration projects and one large soil conservation district. The work was begun with the thought that the vegetation climaxes, if mapped in enough detail, would serve as reliable indicators of the probable secondary successions and the plant-growth adaptabilities of the sites on which conservation work was to be planned. It was considered that, for practical purposes, edaphic communities, which are due to physiographic or other features likely to persist through several human generations, are as significant for the sites they occupy as are the climatic climaxes where they prevail. Accordingly, a classification of natural vegetation types including both edaphic and climatic climaxes was adapted from the descriptions of the plant formations, associations, and associes by Weaver and Clements (1929) and by Bruner (1931). Using this classification, the original vegetation pattern was reconstructed from existing stands of the natural cover or remnants of the original, combined with an interpretation of successional evidence, plotted to scale on appropriate base maps.

As the work progressed, it was realized that the natural vegetation types had further significance with respect to wildlife, since, as has been pointed out by various authors (Dice 1922, 1931; Pitelka 1941; Carpenter 1940; Smith 1940), animal distribution is correlated with plant associations, and populations of many species vary with the stages of secondary succession within the various types. In recognition of the concept of the biotic community as stated recently by Clements and Shelford (1939), these original vegetation types have come to be regarded as "biotic types." Since it is considered that the climax dominants of terrestrial biotic communities always are plants (*ibid.*), it is possible to identify the whole biotic community by the same dominant plants that characterize the vegetation type.

According to these concepts, the biotic types of the following localities were mapped on a scale of 1 inch to the mile:

Watershed	*Approximate area*	
	Sq. mi.	Acres
Taloka Creek, Haskell County	48	30,720
Pecan Creek, Muskogee County	55	35,200
Pryor Creek, Mayes County	113	72,320
Stillwater Creek, Payne County	278	177,920
Henry House and Tulip Creeks, Carter County	45	29,600

[1]This work was accomplished while the author was serving as a biologist for the U. S. Soil Conservation Service. Acknowledgment is made of the assistance of H. L. Whitaker in devising methods and mapping the nine small areas known as "demonstration projects", and to W. H. Kellogg for assistance in mapping the Upper Washita Soil Conservation District.

Portion of Little Washita River Watershed, Grady County	66	42,240
Upper Cow Creek, Stephens County	62	39,680
Camp Creek, Dewey and Woodward Counties	42	26,880
Upper Elk Creek, Beckham County	61	39,040
Upper Washita Soil Conservation District, Roger Mills and Custer Counties	1,836	1,175,040
Totals	2,606	1,668,640

In these areas, and in the reconnaissance mapping along highways, the following biotic types and subtypes have been recorded:

A. *Deciduous Forest Formation*
   1. Cypress-Tupelo (*Taxodium-Nyssa*) Forest Type
      a. Cypress (*Taxodium distichum*) Forest Subtype
   2. Elm (*Ulmus*) Forest Type
      a. American Elm (*Ulmus americana*) Forest Subtype
      b. Willow-Elm (*Salix-Ulmus*) Forest Extension Subtype
   3. Elm-Oak (*Ulmus-Quercus*) Forest Type
   4. Oak-Pine (*Quercus-Pinus*) Forest Type
      a. Shortleaf Pine (*Quercus - Pinus echinata*) Forest Subtype
   5. Oak-Hickory (*Quercus-Carya*) Forest Type
      a. Water Oak-Sweetgum (*Quercus nigra - Liquidambar*) Forest Subtype
      b. White-Red Oak (*Quercus alba-Q. rubra*) Forest Subtype.
      c. Northern Oak (*Quercus borealis - velutina*) Forest Subtype
      d. Post Oak (*Quercus stellata*) Forest Subtype

B. *Forest-Grassland Transition*
   1. Elm (*Ulmus-Panicum*) Savannah Type
   2. Oak (*Quercus-Andropogon*) Savannah Type
      a. Oak (*Quercus-Andropogon*) Parkland Subtype
      b. Post Oak (*Quercus stellata - Andropogon*) Savannah Subtype
   3. Shrub (*Rhus glabra - Andropogon*) Savannah Type

C. *Grassland Formation*
   1. Tallgrass (*Andropogon*) Prairie Type
      a. Big Bluestem (*Andropogon furcatus*) Prairie Subtype
      b. Sandhill Bluestem (*Andropogon hallii*) Prairie Subtype
   2. Midgrass (*Andropogon scoparius*) Prairie Type
      a. Little Bluestem (*Andropogon scoparius*) Prairie Subtype
      b. Mesquite (*Andropogon-Prosopis*) Savannah Invasion Subtype
   3. Mixedgrass (*Andropogon-Bouteloua*) Prairie Type
   4. Shortgrass (*Bouteloua-Buchloe*) Type

D. *Grassland-Scrub Transition*
   1. Shinnery (*Andropogon-Quercus*) Savannah Type
   2. Mixed Scrub (*Andropogon-Rhus trilobata*) Savannah Type

E. *Grassland-Sagebrush Transition*

1. Sand Sagebrush (*Andropogon-Artemisia*) Savannah Type

Various transitional types, consisting of mixtures of two or more of the above types, also have been noted.

The original maps of the ten watersheds areas are in the files of the U. S. Soil Conservation Service. From these maps and the reconnaissance transects, which traverse 65 counties of the state, it is possible to present a map (fig. 1) which, though quite general, shows the natural vegetation or major biotic types in somewhat more detail than any map previously published (Shantz and Zon 1924, Bruner 1931, Blair and Hubbell 1938, Carpenter 1940.). The work of previous authors has been freely used in delineating the types in portions of the state not covered by my own observations.

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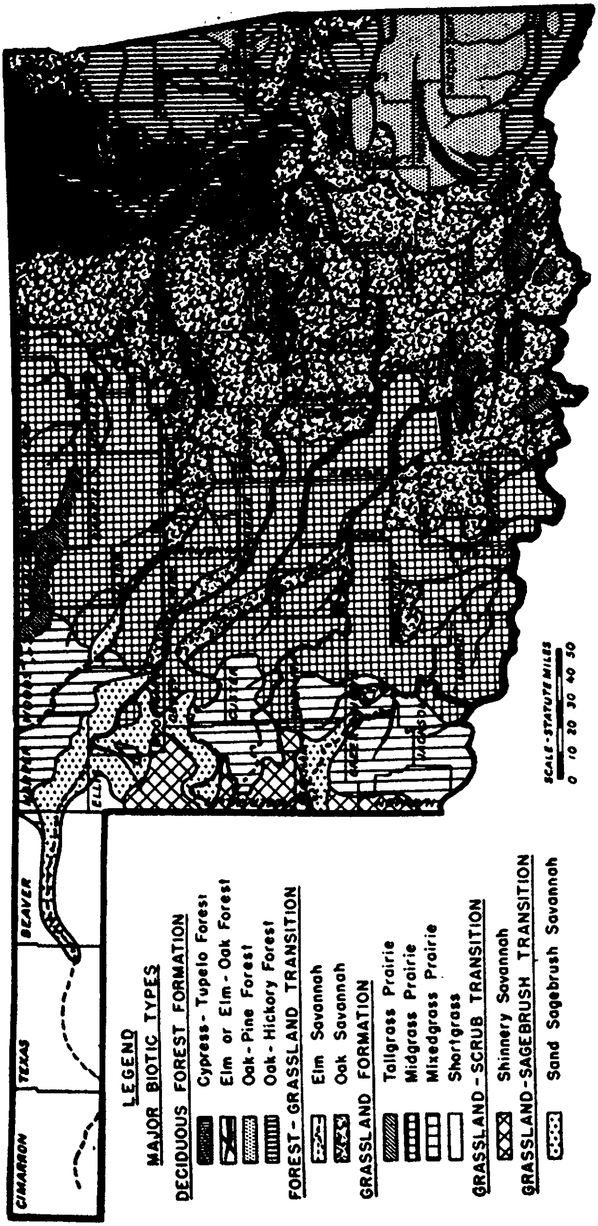
CIMARRON
TEXAS
BEAVER
LEGEND
MAJOR BIOTIC TYPES
DECIDUOUS FOREST FORMATION
Cypress - Tupelo Forest
Elm or Elm - Oak Forest
Oak - Pine Forest
Oak - Hickory Forest
FOREST - GRASSLAND TRANSITION
Elm Savannah
Oak Savannah
GRASSLAND FORMATION
Tallgrass Prairie
Midgrass Prairie
Mixedgrass Prairie
Shortgrass
GRASSLAND - SCRUB TRANSITION
Shinnery Savannah
GRASSLAND - SAGEBRUSH TRANSITION
Sand Sagebrush Savannah
SCALE - STATUTE MILES
0 10 20 30 40 50

Fig. 1.