Forest Data Base for Arkansas

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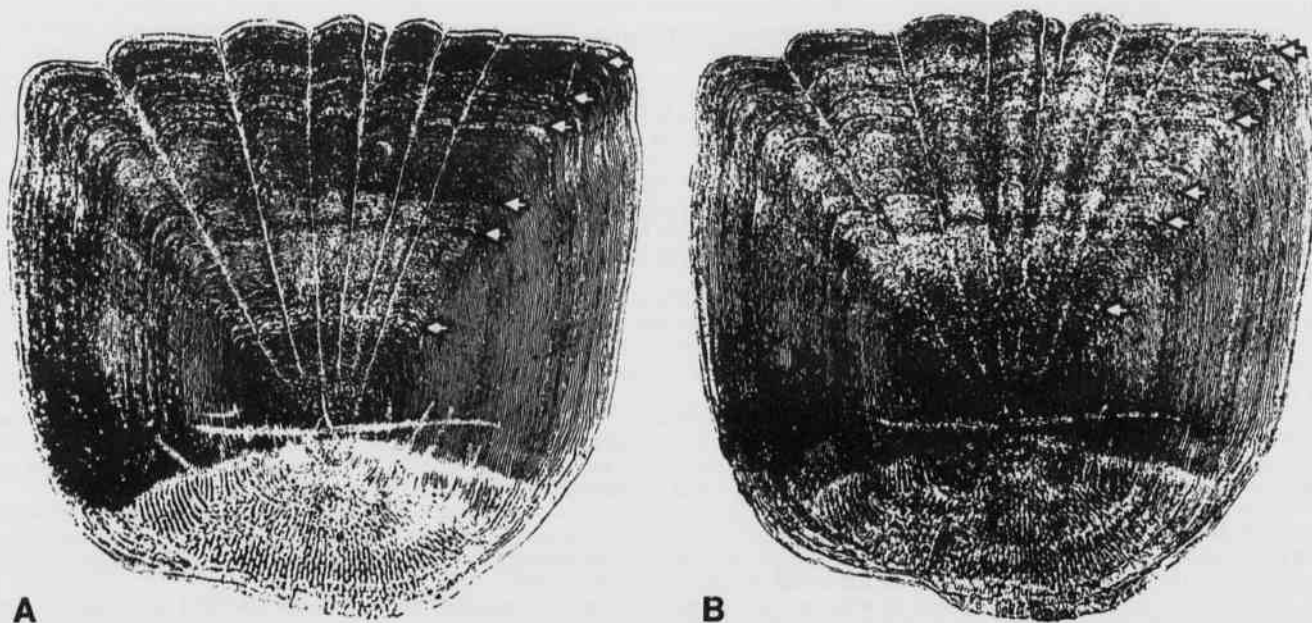## Recommended Citation

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Figure 2. Photocopies from plastic scale impression (A) and dry unmounted scale (B) of a six-year-old (T.L. 393 mm) largemouth bass from Crystal Lake, Arkansas.

LITERATURE CITED

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A FOREST DATA BASE FOR ARKANSAS

The forest-derived resources of Arkansas form the largest single group of natural resources in the State. The timber, water, and wildlife of the forest form much of the basis for our wealth as a state. Our forests, directly or indirectly, provide Arkansas with recreational opportunities, jobs and many of the products that we need for shelter. The watersheds of our forests provide Arkansas with high quality water to maintain life, to irrigate our crops, for recreation and provide avenues for transportation. The economic importance of the forest sector has long been recognized. Estimates place the combined influence of direct and indirect employment, services and commodities between one-quarter and one-third of the state's gross product on a yearly basis (Troutman, et al., 1981, Forests and the Arkansas Economy, Industrial Research and Extension Center, University of Arkansas).

Perhaps harder to measure, but also of significant importance, is the great diversity of ecological communities within the state. Many of these communities are populated with flora and fauna that exist nowhere else. The total quality of our lives are directly or indirectly influenced by these communities and the complex interrelationships that are characterized by them.

Because the forest comprises a majority of Arkansas' total land base (52%) (Quick and Hedlund, 1979, Forest Statistics for Arkansas Counties, Southern Forest Experiment Station, New Orleans, La.) and because it is a complex and dynamic biological community of flora and fauna, much of the basic scientific and ecological research that is carried out in the state is forest based. Much of the pure forest research that is conducted deals not just with individual tree biology, but with large scale mensurational and ecological information that includes stand and total forest descriptions. Additionally, much of the economic research in the state takes into account the contribution of the forest sector to the state's economy.

One problem that has existed for some time in Arkansas, especially for forest researchers, is the lack of available information on the total forest system of Arkansas. Often information must be garnered piecemeal from many sources with the inherent problems of data inconsistency being rife. Requests for data often must go unanswered, or information, clearly out of date, is supplied with apology.

In order to provide a consistent base of forest resource information to researchers and planners in the state, planning was initiated in January 1985 for a computerized forest data base. The original data base, as conceived, would have provided only information on the timber resources of Arkansas, the influence of the forest industry sector on the state's economy and generally be a storehouse of timber-related statistics. The response

to the data base concept was so well received by state officials, forest industry, regional planners and researchers that the original concept of the data base has been broadened to include information on the total forest ecosystem, including wildlife and other forest based resources. The system is now operational and data processing and research work has begun at Monticello.

Existing sources of forest information were first investigated to determine what data were available. No single source of information could provide all of the information that was desired in the Monticello data base. However, the information that could be provided, in concert, did meet the initial needs of the project. A brief description of the data and the identified sources follows.

The U.S. Forest Service (USFS) has 3200 permanent forest inventory plots located in Arkansas. These plots are resampled on a ten year cycle. The information from the plots include 98 different variables, including the volume of growing stock, growth rates of the trees on the plots, ownership class, and changes in land use of the plot. The information in published U.S. Forest Service analyses has for many years provided foresters in the state with information about the nature of the forest resource, the expected changes in the forest over the next cycle and an index to the total health of the resource. One problem with the Forest Service Survey however, is the long cycle period. Because of rapidly changing land use, changes in forest products markets and industrial shifts within the state, this information quickly becomes dated. A mid-cycle survey of 10% of the plots is conducted to ease the problems of the long cycle. However, the information from this sample is not as detailed as the full survey. Supplementary information is needed to aid in interpretation of the USFS information. The forest survey information for the last full cycle survey, and the mid-cycle survey just completed will be brought to Monticello and put in our data banks.

Supplementing and complementing the forest survey information will be information from the Arkansas Forestry Commission (AFC) in Little Rock. The State Forester has agreed to provide us with regeneration, harvest, wildlife and industrial production information for the state from their files. The addition of this information to the data base at Monticello will help to complete the picture of forest growth, removals and industry activity within the state. Reports for regions and sub-regions within the state, with information available down to county level can be developed with these additions to the data base.

Information on wildlife populations and dynamics will be obtained from the Arkansas Game and Fish Commission (AGFC) and the U.S. Fish and Wildlife Service. This will include information on herd movements, estimated herd densities and changes in the wildlife base due to changes in land use, hunting pressure and changes due to forest habitat manipulation.

A major bank of information has been collected by the Arkansas Economic Information System (AEIS) located at the University of Arkansas at Little Rock. Researchers there have for several years been amassing data that describes the total economy of the state. Included in their data is information that describes the general health of the work force, wage, employment, earnings, and productivity by industry. The information pertaining directly to the forest sector is of greatest importance to this project. Using their information, in conjunction with the forest descriptive information, the total forest sector of the state can be modeled. A model of this type will describe not only the forest resource, but also the effect that the dynamic forest sector has on the total economy of the state.

Much of the health of the forest sector is directly related to national and international markets for forest products. Prices, demand and supply projections form the basis of much of the econometric modeling that is carried on by forest industry planners. Access to regional and state stumpage price information for a considerable period of will be included to extend our data base. National marketing information is available and will complement the state level data that have already been recovered.

As we become aware of other information, we will attempt to incorporate it into the system at Monticello. We feel that only by having all of the information about the forest based resources at one place can we paint the total picture as it exists.

The initial statistical reports from the data base will be primarily of a descriptive nature. Summary statistics describing the forest resource, by location within the state should be produced within the next year. Later, summary reports will be produced for each of the major regions of the state and subregions of specific interest. We will also be able to handle requests for data from other researchers around the state. The information that we have will be available to all who desire it, limited only by our total work load. The first report of summary statistics should be completed by late 1986 and include the updated forest survey information, the status of the forest products industry within the state and growth projections for the next few years. Certain wildlife information will also be included in the report.

One of the principal concepts behind assembling the data base was to provide a basis for long term research within the state. Charting the dynamic character of the forest resources of the state will, by its very nature, take time. Cross-sectional data alone does not provide the ability to view the changes that occur over time in our resource base. Consequently, we will update the time series information to complement the periodic cross sectional views that we gain from the forest surveys and updates. Modeling the changes in the forest resource over time will give us the ability to not only accurately describe the past but to be predictive about the future.

Within a year we will be developing the first of the forest resource models, including those factors that we believe are important. For example there is considerable interest in the development of a stumpage prediction model for the state. A second, and related model will address the growth-drain patterns of timber within the state. Other models have been suggested and as time permits they will be investigated.

Because of the tremendous volume of data that will be located at Monticello, it is natural to make available as much information, in the most usable format, to the greatest number of people. Contract research, looking at relatively narrowly defined problems, is a service that we will be equipped to provide. The details of this type research have not yet been worked out, but the concept has been discussed.

Clearly, the data base as described is macro in scale and design. The information, statistics, and research flowing from it, will provide researchers with new opportunities to better understand the forest ecosystem that is such an important part of our state. The data base will be a resource data pool for any who desire to use it. Participation in this project by any cooperators is welcomed. The computer capability and the expertise is present to store, retrieve, merge and sort data from any different sources. However, in order to reach its true potential as a research and scientific resource, others should be included in the work that has been started. To this end, we are seeking your help and guidance on what additional information should be included in the data base. We are open to discussing participation in this project with other researchers, interested groups and cooperators within the state.

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AN INTRODUCTORY CHEMISTRY COURSE

The Department of Chemistry at Arkansas State University teaches general chemistry to over 400 non-chemistry majors each year. The range of academic preparation in the physical sciences of these students is very broad because the university has an open admissions policy. Consequently, general chemistry is presented assuming that the student has had little exposure to the study of chemistry.