

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA**

STATE OF OKLAHOMA, Plaintiff,

vs.

Case No. 4:05-cv-00329-TCK-SAJ

TYSON FOODS, INC., et al., Defendants.

EXPERT REPORT OF LOWELL CANEDAY, PhD

May 14, 2008

Prelude: Experience and Qualification

As a professor in Leisure Studies (often alternately titled Recreation, Parks, and Tourism in other academic settings) at Oklahoma State University since 1981, I have authored 30 nationally or internationally refereed research articles, 24 state or regional articles, 66 technical research reports, and numerous other publications. In addition, I have been the principal investigator or co-principal investigator on more than 50 funded research projects totaling \$3.21 million. Most of these research projects and resulting publications have focused on the relationship between human recreational activity and recreational environments. It is well documented that recreational environments influence both the individual and the individual choice of activity, and human activity influences the recreational environment.

In addition to the academic experience related to the interface between humans and the environment in recreation settings, my educational background has emphasized this same linkage. I completed my Doctor of Philosophy (Ph.D.) at the University of Minnesota – Twin Cities in Recreation, Park and Leisure Studies in 1981. That degree

followed a Master of Arts degree in Recreation and Park Administration from the University of Wyoming (1971) and a Bachelor of Arts in Mathematics from LeTourneau College (now LeTourneau University) in 1970.

Beyond the academic arena, my professional employment experience has encompassed the same relationships between human recreational activity and the natural environment. I worked as a seasonal park ranger with Minnesota State Parks, assigned primarily to Interstate State Park on the St. Croix River between Minnesota and Wisconsin. The St. Croix River is one of the original seven federally designated wild and scenic rivers, and remains a significant resource with varying segments classified as “Wild”, “Scenic”, and “Recreational.” The St. Croix River is an internationally known canoe river, readily accessible from population centers such as Minneapolis (MN), St. Paul (MN), and Madison (WI). In addition, I have worked with municipal park and recreation departments in Texas and Minnesota in settings in which human interaction with the environment was a major portion of my administrative responsibility.

Specific research I have completed includes: the Illinois River management plan (2000); multiple statewide comprehensive outdoor recreation plans; numerous recreation management plans for lake environments; extensive recreation visitor studies; and economic analyses of recreation-driven tourism. Agencies that have funded these research efforts include the Environmental Protection Agency, the National Science Foundation, the National Park Service, the U.S. Forest Service, the Army Corps of Engineers, Oklahoma Tourism and Recreation Department, and numerous communities. In return, these agencies have utilized that research in planning, development of policy, and in operation of the respective agencies.

In addition to the academic credentials, I am a Certified Park and Recreation Professional (CPRP), a status that requires on-going and continuous education and professional development. I am a Fellow of the American Leisure Academy and the American Academy of Park and Recreation Administrators.

As a scholar, much of the research I have conducted requires data collection and observation in the field. This has been true with the Illinois River and Lake Tenkiller. In addition to research methodologies that require remote access to the resource base, I have utilized research methodologies that require on-site access to the resource and the visitor. As a result, I have spent considerable personal time in the Illinois River corridor and around Lake Tenkiller. This includes numerous floats on the Illinois River, camping at public access locations, visits to state park properties, visits to Army Corps of Engineers locations, meetings in communities throughout the region, and direct personal contact with innumerable visitors to the river and lake.

Based on this experience and these qualifications, I have been retained by the Attorney General of the State of Oklahoma to provide information and documentation of recreational use, related impacts, and the effects of the environment on recreational use in the Illinois River corridor and Lake Tenkiller. Further, with my experience and cited qualifications, I have been asked to provide expert opinions and expert interpretation of information related to recreational use of the Illinois River corridor and Lake Tenkiller.

Patterns and Volume of Recreational Use on Illinois River

For the purposes of definition, the Illinois River in Oklahoma is that stream distance and surrounding corridor from Lake Francis on the border between Oklahoma and Arkansas to Horseshoe Bend public access. Horseshoe Bend is the traditional

demarcation between the riverine environment of the Illinois River and its tributaries and the lacustrine environment of Lake Tenkiller. However, the “float” portion of the Illinois River is most commonly identified as the river distance from the Highway 59 bridge near Watts to the Highway 51/62 bridge northeast of Tahlequah.

The Illinois River, its tributaries and the surrounding watershed of eastern Oklahoma, on the western edge of the Ozark Plateau, is a unique resource in Oklahoma. The Illinois River and its tributaries offer the only free-flowing canoe or recreational float streams permitting continuous floats of three hours or more in Oklahoma. With the combination of adequate water flow to permit recreational floats, a watercourse without impoundment, a history of reasonably clear and clean water, supporting outfitters, public access and management, and the surrounding beauty of a natural watershed, the Illinois River, Flint Creek and Baron (Barren) Fork Creek are the premier canoe resource in Oklahoma.

The Illinois River had been studied for possible inclusion in the National Wild and Scenic River system. As stated in that report of the former Heritage and Conservation Recreation Service, “Picturesque bluffs about the river over much of its course, affording the user much scenic variety. The pastoral setting of an agricultural valley adds to the recreation enjoyment. Water quality continues to support a diverse fishery, although deteriorated from past years. Characteristic water clarity is one of the stream’s most attractive attributes” (U.S. Department of Interior, 1979). The recommendation of that study was to continue management and designation of the Illinois River under state oversight with the formation of the Oklahoma Scenic Rivers Commission.

Utilizing the classification system of the Recreation Opportunity Spectrum (Clark and Stankey, 1979), the Illinois River corridor would be categorized on the less developed end of the spectrum. The Illinois River Management Plan (Yuan and Caneday, 1999) classified the environment as being a “roaded, rural” environment based upon the characteristics defined in the Recreation Opportunity Spectrum. That classification continues to the present for that portion of the river and its tributaries between Lake Francis and the Highway 62/51 bridge.

Comparable rivers in the south-central portion of the United States include portions of the Niobrara River in Nebraska, the Buffalo River and the White River in Arkansas, and the Eleven Point River, the Black River, and the St. Francis River in Missouri. However, Oklahoma and its residents have no other in-state options to match the features provided by the Illinois River corridor. Much shorter sections of the Blue River and the Mountain Fork River offer opportunities for canoeing, but without the additional amenities and natural features of the Illinois River.

Most rivers in Oklahoma flow from the northwest to the southeast in broad, open plains. These rivers can be characterized as being flat water with seasonal fluctuation in volume of flow. They also flow through generally open agricultural lands. None of the longer rivers in Oklahoma provide the recreational opportunities for floating, the necessary water quality for primary body contact recreation, or the aesthetic qualities desired by visitors. The two segments on the Blue River and the Mountain Fork offer very short stretches in which floating is possible, but these rivers do not have the outfitters or support features provided on the Illinois River.

Historically, floating has been one of several recreation pursuits on the Illinois River. Fishing, swimming, sightseeing, camping, hiking, bird-watching, and other recreation have all been popular human connections with the Illinois River and the surrounding valley. While floating and canoeing occurred on an individual basis throughout human history with the river, the volume of activity was quite low through the 1960s. During preparation of the Illinois River Management Plan, my research staff and I located archival photographs of fishing, canoeing, and other outdoor recreation activity along the Illinois River from the early 1900s. Clearly the resettled Cherokee Nation utilized the Illinois River for recreation, transportation, and subsistence, as did more recent residents of the area (Exhibits 7, 8, 9, 10, and 11).

Based on photographs and anecdotes from long time river visits, it was quite common to float the Illinois River in a john boat or enjoy a picnic, swimming, and fishing outing along the river or one of its tributaries. Documentation and enumeration of the volume of such use prior to 1960 is very limited. However, in 1961 an article in the *Daily Oklahoman* reported that “more than 1500 boat-loads of fishermen made successful excursions down the swift moving stream in the past year” (*Daily Oklahoman*, 1961).

Kenneth Smith commented on recreational use of the Illinois River as he stated, “Not until the 1960s did recreationists ‘discover’ the Illinois River. By that time people had more money, leisure and mobility. Oklahoma Highway 10 had become a paved-through route along the river, and canoeing was a new way to have a good time” (Smith, 1977). He also recounted a conversation with a local resident, Herb Gregory, who indicated that visitation was very low during the 1930s, 1940s, and 1950s. The exception to that visitation pattern was anglers, particularly Native Americans “snagging redhorse

in July” (Smith). In 1969 T. L. Ballenger wrote “Because of the river’s clear water and gravelly bottom, it is especially suitable for swimming and floating. It has always been among the best fishing streams in the state” (Ballenger, 1969).

As cited in the Illinois River Management Plan (Yuan and Caneday, 1999), National Park Service data reveal that 600 canoes were rented from established concessionaires in 1970. Through the decade of the 1960s, approximately a half dozen outfitters provided primary access to the river for visitors. Anecdotal evidence indicates that 1968 marks the beginning of growth in outfitters along the river. A combination of factors influenced that growth, including changes in technology in construction of canoes (toward aluminum and fiberglass), improved highway access, improved economic conditions and a general cultural and social movement toward outdoor recreation by the masses.

By 1975, that number of recreation canoe rentals had grown to over 36,000, a 600% increase in demand within a five year period. In 1977, the Oklahoma Scenic Rivers Commission (OSRC) was established as an agency of the State. A few local businesses were serving as outfitting agents prior to the establishment of the OSRC, but with the advent of OSRC, commercial float operation was placed under the governance of that commission. As a result, documentation and enumeration of float trips and floaters was standardized and uniformly reported. By 1997, there were 58,000 float trips annually on the Illinois River.

Through the decade of the 1970s, the concessionaires operating along the river offered canoes for rental floats on the Illinois River. During the 1980s, several outfitters expanded their rental options to include inflatable, flexible rafts that could carry six to

eight people. Early in the 1990s, one outfitter experimented with single and dual kayaks, and that option has expanded to other outfitters during the recent decade.

In 1993, the OSRC approved guidelines related to water flow and water levels for canoeing and rafting. Those guidelines are now published on real-time World Wide Web sites permitting up-to-the-minute decisions for potential floaters. In my experience of interviewing visitors to the river, floaters do utilize that information. However, there are floaters for whom high water is the desired condition for a recreational visit to the Illinois River. As a result, floating does occur in all but the most extreme conditions.

During the past four years (2003 – 2007), an average of 117,685 floaters visited the Illinois River for a recreational float (Exhibit 2). During this period, the measure for standardized reporting of recreation activity became “floaters” rather than “float trips” as cited earlier. Annually, another 37,870 visitors visit the Illinois River for a recreational experience, but do not float. The months of May through August produce slightly more than 90% of this visitation.

A recreational float typically involves a visit to one of the authorized outfitters licensed under agreement with the Oklahoma Scenic Rivers Commission. These outfitters provide canoes, kayaks, and rafts or other inflatable floats (i.e. inner tubes) to accommodate the floaters. Float trips vary in length of time and river miles, although most float experiences are about four hours in length as documented in research leading to the Illinois River Management Plan (Yuan and Caneday). Some floats, with adequate water, may run the length of the floatable portion of the Illinois River and require multiple days on the river.

A typical float includes a bus ride from the outfitter's location to an in-put location at a public access property along the Illinois River. The floater then floats, with occasionally paddling, to a take-out location downstream. Along the way, the floater typically swims at various deeper pools in the Illinois River; gets out of the watercraft occasionally to walk through shallow water or avoid obstacles; wades in the river; enjoys one of the several rope swings that have been tied to trees along the river; and consumes liquid for hydration and refreshment. Some visitors may include a picnic lunch or other refreshment along the way.

A floater first contacts water in the Illinois River at the time he or she wades to the canoe or raft. Floaters are expected to wear a personal floatation device which is usually wet from contact with water during prior uses. Throughout the float trip the recreational floater will be in contact with water in the Illinois River due to leaks in the watercraft and resulting inflow of water; due to horseplay and resulting splashes or capsizing; due to accidental capsizing; and due to deliberate actions to swim in the cooling waters.

It is fairly common for floaters to experience cuts, scrapes and scratches during a float experience. These normally minor skin injuries occur because of the rocks on the river bottom, over-hanging tree branches, or debris in the river encountered during the float. Upon occasion there are more serious injuries, including drowning and other deaths, resulting from various recreational activities and encounters in the river corridor.

Following a float experience, most floaters then spend several more hours in wet attire either driving home or as they enjoy additional time in the river corridor. Relatively few floaters shower immediately following a recreational float for a variety of reasons,

including (1) lack of showers at public access locations, (2) lack of adequate facilities at properties managed by the private outfitters, and (3) personal choice in hygiene among the floaters.

A small portion of the floats on the Illinois River occur in privately owned craft – outside those offered by licensed, commercial outfitters. These personal trips are regulated by OSRC rules, require licenses on the watercraft, and follow the same general pattern as commercial floats. These personal trips would differ from commercial floats in that transportation to a put-in location or take-out location would be by private vehicle.

A non-floater recreational experience usually includes a visit to one of the public access locations. The visitor then swims, picnics, sunbathes, and occasionally camps in the river environment. Some are also anglers and choose to fish during their visit. Some of these non-floaters remain camped at a public access location or on an island from Friday through Sunday during the summer. Others visit for several hours on a given day and return to another location at the end of a day. These public access locations do not include shower facilities, and most of the non-floaters practice minimal personal hygiene during their visits to the river.

In addition to the foregoing recreation activities, other non-floater visitors to the Illinois River corridor participate in a variety of recreation activities. Driving for pleasure (touring) is the number one outdoor recreation pursuit among residents of the United States. Visitors to the Illinois River corridor often drive the roads on either side of the river, enjoying the rural scenery and the aesthetic qualities of the valley. In addition, they frequently fish, hike, bike, or bird-watch within the river corridor.

The United States Army Corps of Engineers calculates recreation visits and recreation hours at its properties. Along the Illinois River, only recreation visits are actually calculated for floaters since the OSRC and outfitters do not calculate time for individual floats. These recreation visits, as float trips, are reported by the Oklahoma Scenic Rivers Commission based on number of trips and permits sold by the various outfitters in the river corridor. However, with an average of four hours per trip on the Illinois River, a conservative estimate of the number of recreation hours can be determined (See Exhibit 1 and Exhibit 2).

- For 117,685 floaters, 470,740 recreation hours occur annually.
- For 37,870 non-floaters, a minimum of 151,480 recreation hours occur annually.
- A total of 622,220 recreation hours occur annually for visitors and floaters on the Illinois River and within the traditional river corridor.

Patterns and Volume of Recreational Use on Lake Tenkiller

Tenkiller Ferry Reservoir, more commonly known as Lake Tenkiller, was authorized under the Flood Control Act of 1938 (Caneday and Neal, 1996). Specific authorization for the installation of hydroelectric power generation features was given in the River and Harbor Act of 1946. With the impoundment of the Illinois River at an area formerly operated as a ferry location by the Tenkiller family, the lake was at full flood control operation by July 1953 with power generation on line in December 1953.

Commonly known as Lake Tenkiller, the impoundment is located in eastern Oklahoma extending from northern Sequoyah County into Cherokee County. The dam was constructed 12.8 miles upstream from the confluence of the Illinois River and the Arkansas River. Lake Tenkiller Dam is a rolled earth-fill impoundment approximately

3,000 feet long and 197 feet above the streambed. Outlet from the lake includes ten tainter gates, a hypolimnetic conduit, and a hypolimnetic intake to the powerhouse.

When Tenkiller Ferry Dam was completed in 1953, it was the second highest dam in Oklahoma. During the past several years, the U.S. Army Corps of Engineers has been constructing a new auxiliary spillway with five new tainter gates.

Lake Tenkiller is the only remaining impoundment on the Illinois River, a river which originates in northwestern Arkansas and flows generally southwest upon entering Oklahoma. The drainage basin above the dam includes the Illinois River, Caney Creek, Dry Creek, Elk Creek, Sixshooter Creek, Terrapin Creek, Chicken Creek, Snake Creek, Cato Creek, Pine Creek, Salt Creek, Dogwood Creek, Burnt Cabin Creek, Sisemore Creek and Pettit Creek. The total drainage area of the Lake Tenkiller watershed is 1,610 square miles with an actual impoundment of 12,900 acres at normal pool. While the entire lake is in Oklahoma, about 55% of the watershed feeding Lake Tenkiller is in Oklahoma. The remaining portion of the watershed is in Arkansas.

Primary highway access to Lake Tenkiller is provided by Interstate Highway 40 from the southern portions of the Lake, Oklahoma Highways 100 and 82 along the eastern portion of the Lake, Oklahoma Highway 10A along the southwestern portion of the Lake and numerous county roads intersecting these major access routes and leading visitors to the Lake.

Lake Tenkiller was authorized for flood control and hydroelectric power generation under the management of the United States Army Corps of Engineers, Tulsa District. In addition, Lake Tenkiller provides water supply for several local communities and aids the McClellan-Kerr Arkansas River Navigation system through water releases,

although such purposes are not within the original authorized intent for the Lake. While recreation was not specifically included as one of the purposes of Lake Tenkiller, recreation has become an important economic and social benefit of the Lake. The public commonly believes that lakes, built for a variety of other purposes, were actually constructed for recreational purposes. That is certainly true of most visitors to Lake Tenkiller (Caneday, 2000; Caneday and Neal, 1996; Caneday, Jordan, et. al., 2007; Liang, Caneday, and Jordan, 2003).

South of Horseshoe Bend, the Illinois River takes on the characteristics of a lake. Lake Tenkiller is an impoundment on the Illinois River and the primary source of water in the lake is inflow from the Illinois River. From Horseshoe Bend to the Tenkiller Ferry impoundment, Lake Tenkiller is managed by the United States Army Corps of Engineers. Numerous public access locations are available along the east and west sides of Lake Tenkiller under several varying management protocols. These are defined and classified by the Army Corps of Engineers as follows:

- Class A campground with controlled access gate and campground hosts
- Class B campground with campground hosts
- Class C campground with limited services
- Contracted property, typically with concessions operated privately
- Day use area only
- Oklahoma State Park
- No direct, obvious management; marked as ‘closed’ on Web-based maps

As the principal author of a lake management plan for Lake Tenkiller, I wrote in 1996 that “water quality affects the recreational uses and tourism potential for the Lake Tenkiller area . . . The diagnostic and feasibility study on Lake Tenkiller determined that the Lake is currently showing signs of water quality degradation. These symptoms include periodic algal blooms, excessive algal growths, and hypolimnetic anoxia

throughout the stratified period. The lake was classified as eutrophic based upon nitrogen and phosphorus loads which were excessive when compared to published criteria. The trend has been a continual deterioration in water quality since 1974, although some stabilization may have occurred since 1985-1986. The excessive nutrient loads have increased algal growth and compromised water clarity throughout the lake. . . The mean annual concentrations of phosphorus, nitrogen and chlorophyll α measured throughout Lake Tenkiller were indicative of eutrophic conditions” (Caneday and Neal).

During that research effort, public input focused attention on the deteriorating quality of the recreational fishery in Lake Tenkiller and the deteriorating quality of the lake for SCUBA. Historically, there have been numerous comments on the richness of the fishery in the Illinois River corridor. As cited earlier, T. L. Ballenger wrote “Because of the river’s clear water and gravelly bottom, it is especially suitable for swimming and floating. It has always been among the best fishing streams in the state” (Ballenger, 1969). As a result, the waters of Lake Tenkiller offered the potential to sustain a similar high quality fish habitat.

As quoted in the 1996 report, “Water quality in Lake Tenkiller has deteriorated to a point that it has affected the fishery, the success of anglers, the quality of recreation experiences, and the distinctive reputation of Lake Tenkiller as a SCUBA lake.”

During the decade of the 1980s, several local companies and additional businesses in Tulsa provided outfitting and trips for underwater recreational activity (SCUBA). Due to reduction in clarity of water, the demand for such activity at Lake Tenkiller has declined and the number of companies providing those opportunities has decreased. In

addition, the number of locations that provide desirable SCUBA experiences has decreased to a single stretch near Strayhorn Landing at the south end of the lake.

As a personal observation of this decline in SCUBA activity, I served as the Director of the former School of Health, Physical Education, and Leisure at Oklahoma State University and Coordinator of the Leisure Studies program during the 1980s and early 1990s. Oklahoma State University offered SCUBA classes through Leisure Studies that scheduled dive trips to Lake Tenkiller throughout the 1980s and into the 1990s. Enrollment numbers declined dramatically due to student evaluation of the reduced clarity of the water for SCUBA. By 1995, OSU stopped offering the SCUBA trips to Lake Tenkiller and began utilizing Lake Skiatook as an alternate location.

That observation is supported in the work of a group of engineers from the Army Corps of Engineers and Oklahoma State University in 1986. “Tenkiller Lake has historically had clear waters and has been a popular site for SCUBA diving, water skiing, and other recreational activities. Project personnel and local residents explain that water clarity has decreased appreciably at Tenkiller Lake in recent years and nuisance algal blooms have occurred with increasing regularity during spring and summer months” (Nolan, et. al., 1986).

Campers in Army Corps of Engineers campgrounds or Oklahoma State Parks register with the respective management agent. As a result, the number of campers (411,490) is identifiable by property (Exhibit 3). These numbers have been declining over the past four years, but that pattern is not unique to Lake Tenkiller. Except for a brief increase in regional travel in late 2001, since the events of September 11, 2001, recreational travel has declined in most markets.

Day visitors to Lake Tenkiller may picnic, swim, hike, sightsee, or otherwise enjoy the lake environment, but they do not spend a night in any of the public access locations on Lake Tenkiller during their on-site experience. Public access locations around Lake Tenkiller include either magnetic or pneumatic vehicle counters for which the respective management agency has developed and utilized formulae for calculation of visitation levels. For this report, I used the vehicle counters as a base and then did spot checks on number of occupants per vehicle, number of return visits during specific time periods, turnover rate, impact indicators on the recreation resource, and total available amenities (picnic tables, parking spaces, etc.) for visitors.

The past four years show an average of 2,205,869 day visitors annually to Lake Tenkiller based on United States Army Corps of Engineers data (Exhibit 4).

Boaters at Lake Tenkiller gain access to the water through a variety of locations. These include (1) boat ramps in public access locations including state parks and Army Corps of Engineers' locations, (2) marinas in Oklahoma state parks, (3) boat ramps in private concessionaire locations leased from the Army Corps of Engineers, (4) marinas offering a wide spectrum of services in private concessionaire locations leased from the Army Corps of Engineers, and (5) private boat slips and docks at these same locations. There are no private residences with direct access to Lake Tenkiller; therefore, all boating access must come through one of these identified locations. As a result, there is no dispersed use for boating activity.

Boating activity reflects traditional recreational boating, anglers, and tournament fishing. The total of 375,739 boaters (Exhibit 5) as an average over the past four years at Lake Tenkiller reflects a typical party size of 2.87 persons per boat. These boaters may be

campers or day visitors, but they are the visitors in most direct contact with the lake. These boaters may be pleasure boaters, anglers, water-skiers, users of personal water craft, or other recreational users of Lake Tenkiller.

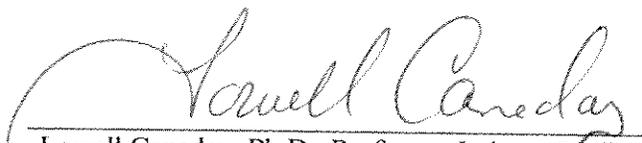
The combined totals of campers and day use visitors (both of which may include boating use) yield the total visitation at Lake Tenkiller. During the past four years, this total has been an average of 2,617,359 persons per year (Exhibit 6). Visitation has declined somewhat during that four year period, although total visitation in 2007 was slightly higher than that of 2006. In summary, Lake Tenkiller use levels over the past four years reflect:

- 411,490 campers (which may include boating activity)
- 2,205,869 day visitors (which may include boating activity)
- 375,739 boaters (all of whom are either campers, overnight visitors or day visitors)
- 2,617,359 persons per year

Concluding Comments

During my 25 or more years of working on the Illinois River corridor, I have heard a frequent claim: "The Illinois is not the quality river it was ten years ago, or even two years ago." Kenneth L. Smith wrote that comment in 1977, an early expression of concern related to the future of the Illinois River, and an early commentary on concerns related to agriculture in the river corridor. I concur with that assessment.

Statement prepared and submitted by:


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MAY 14, 2008
Date

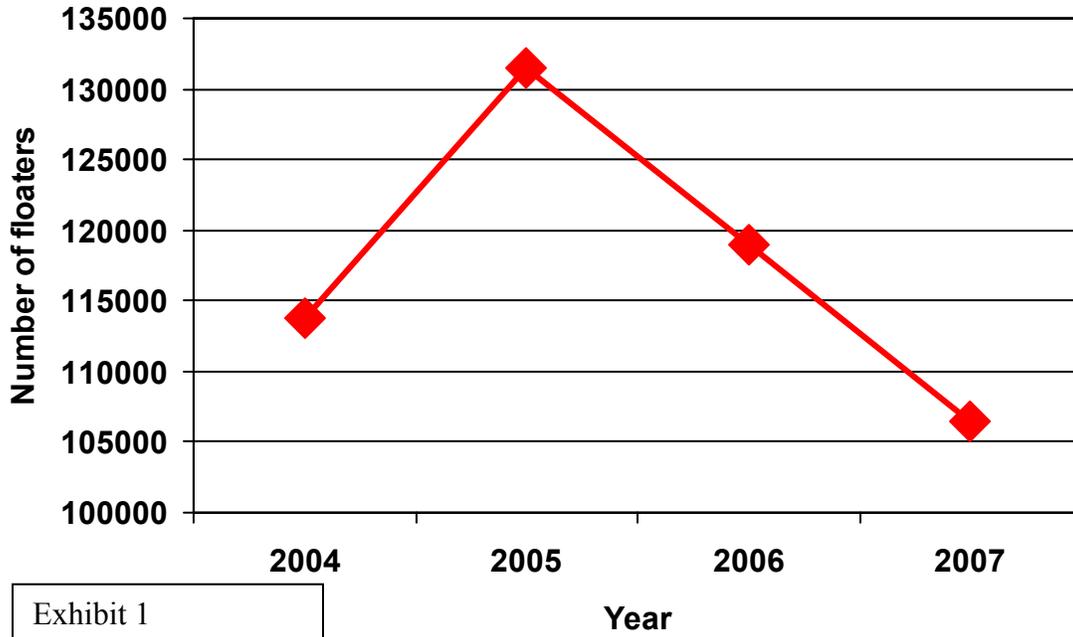
My rate of compensation for study and testimony in this case is \$86.50 per hour plus expenses at established government rates.

Works Cited

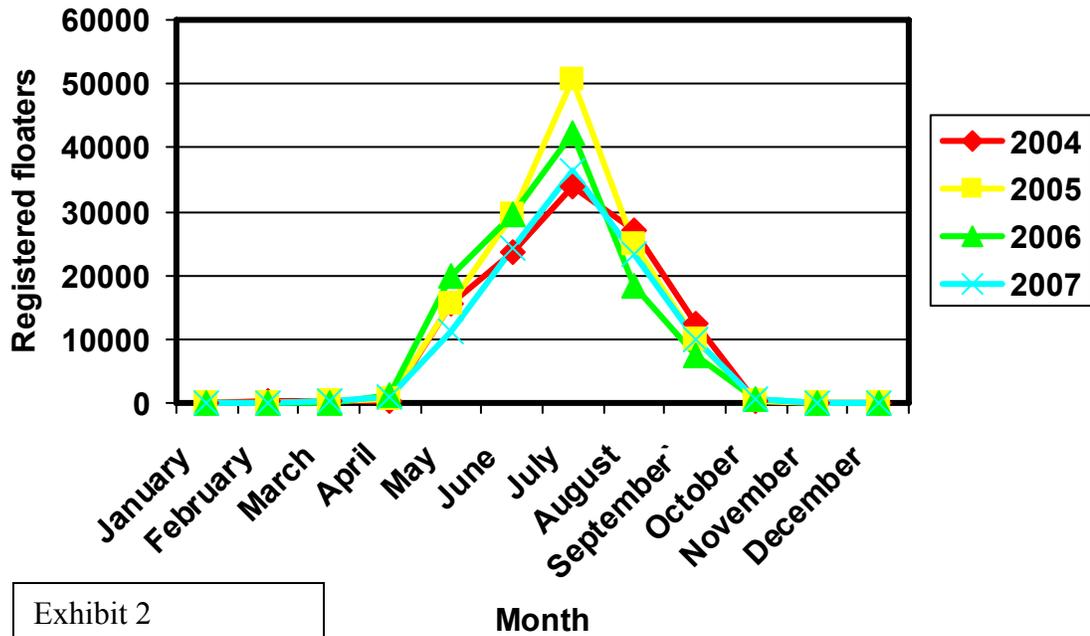
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Exhibits

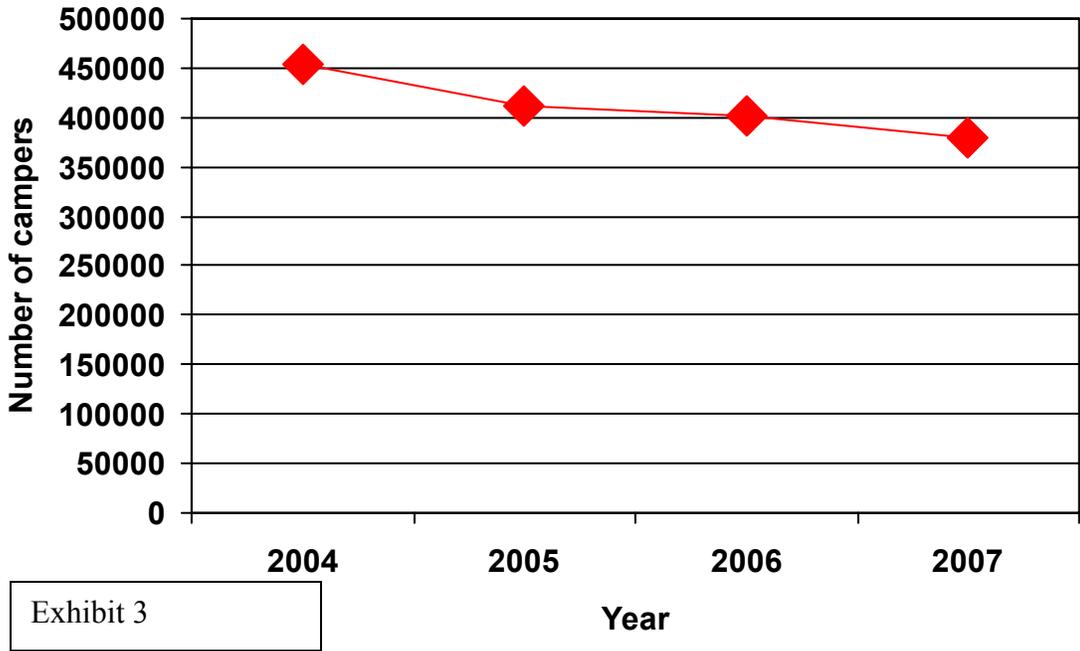
Illinois River Registered Floaters



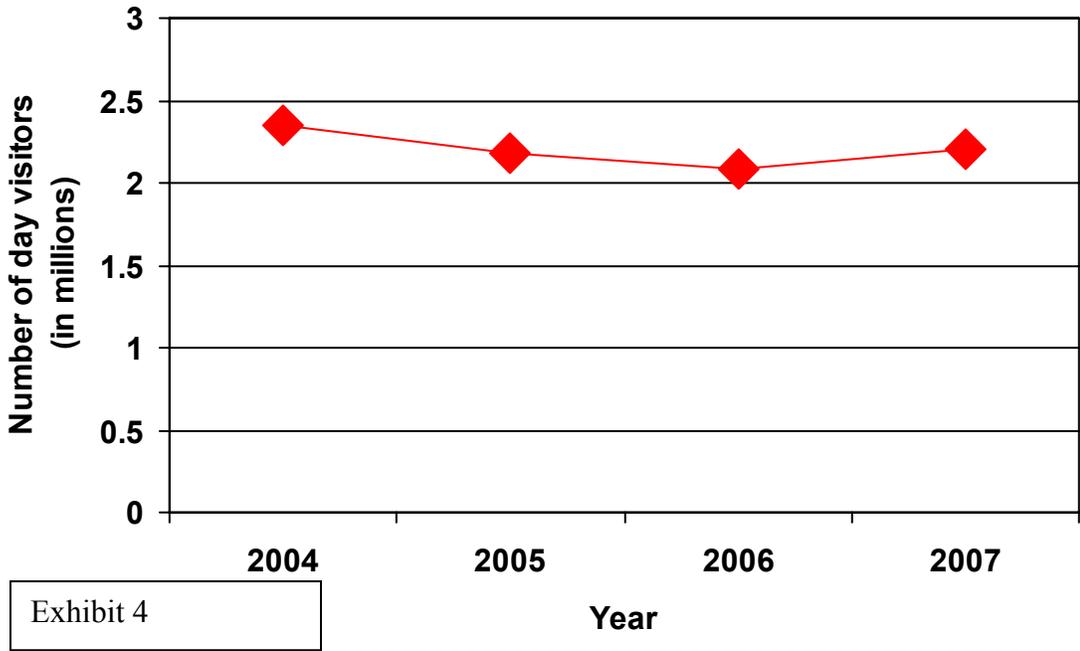
Illinois River Floaters by Month



Lake Tenkiller Campers



Lake Tenkiller Day Visitors



Lake Tenkiller Boaters

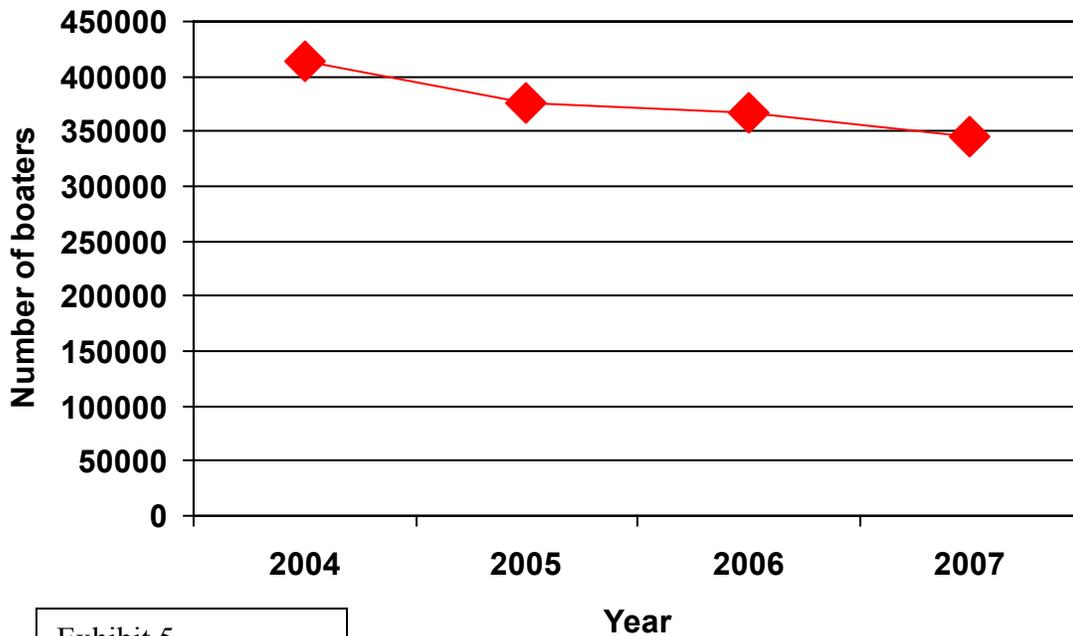


Exhibit 5

Lake Tenkiller Total Visitation

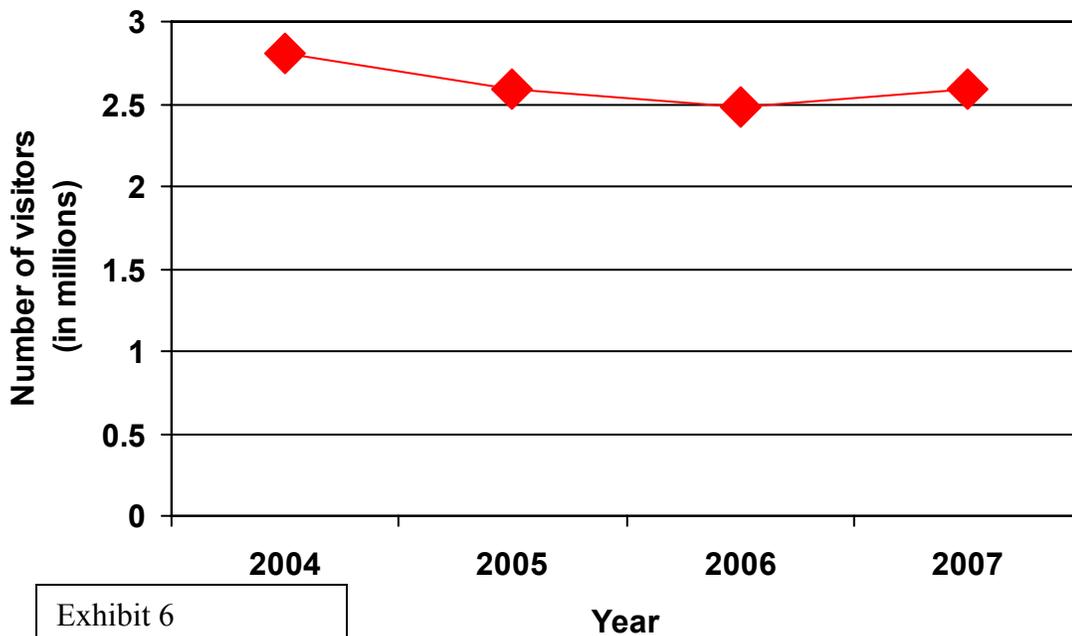


Exhibit 6

Exhibit 7: Lake Francis about 1928

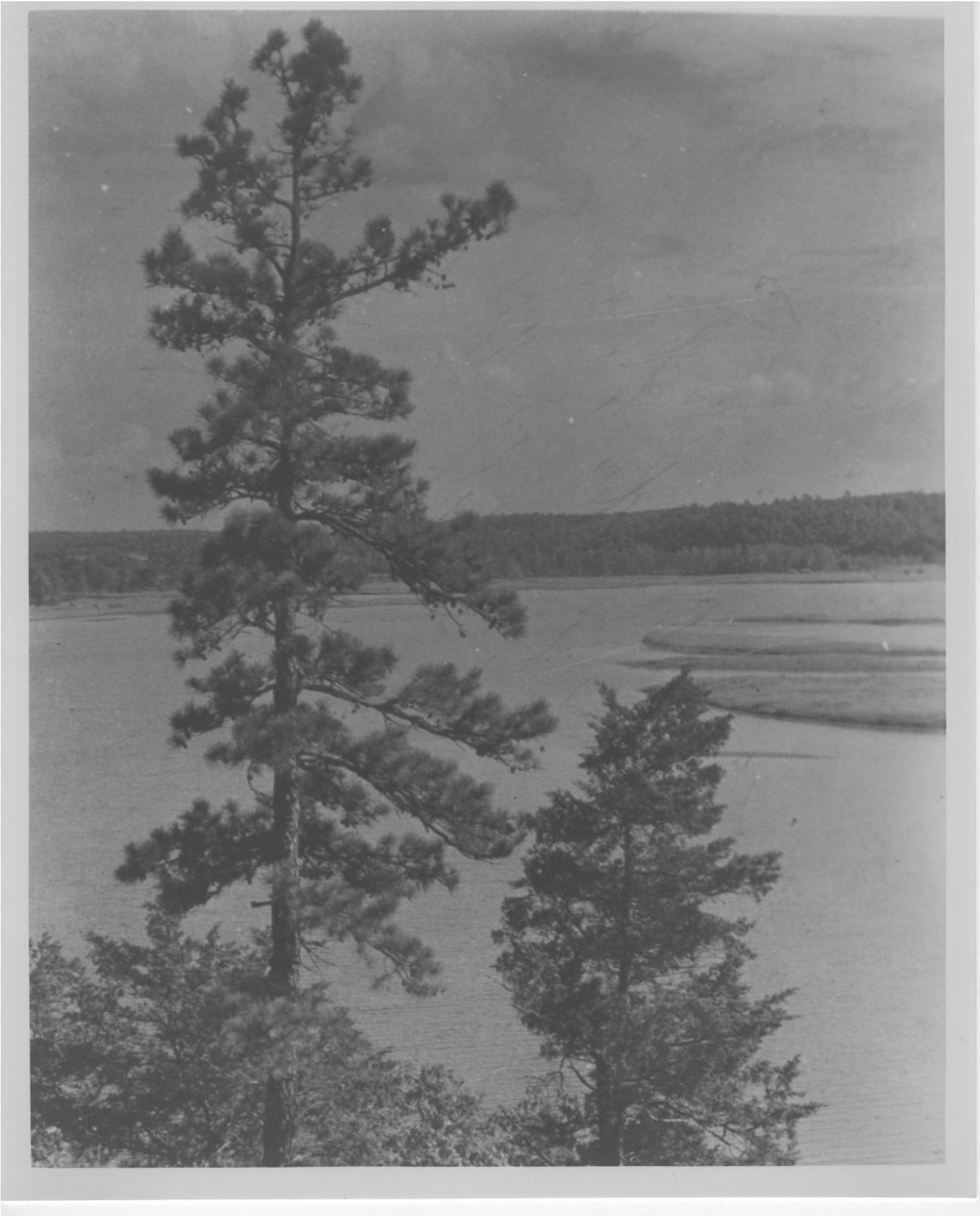


Exhibit 8: Illinois River about 1928

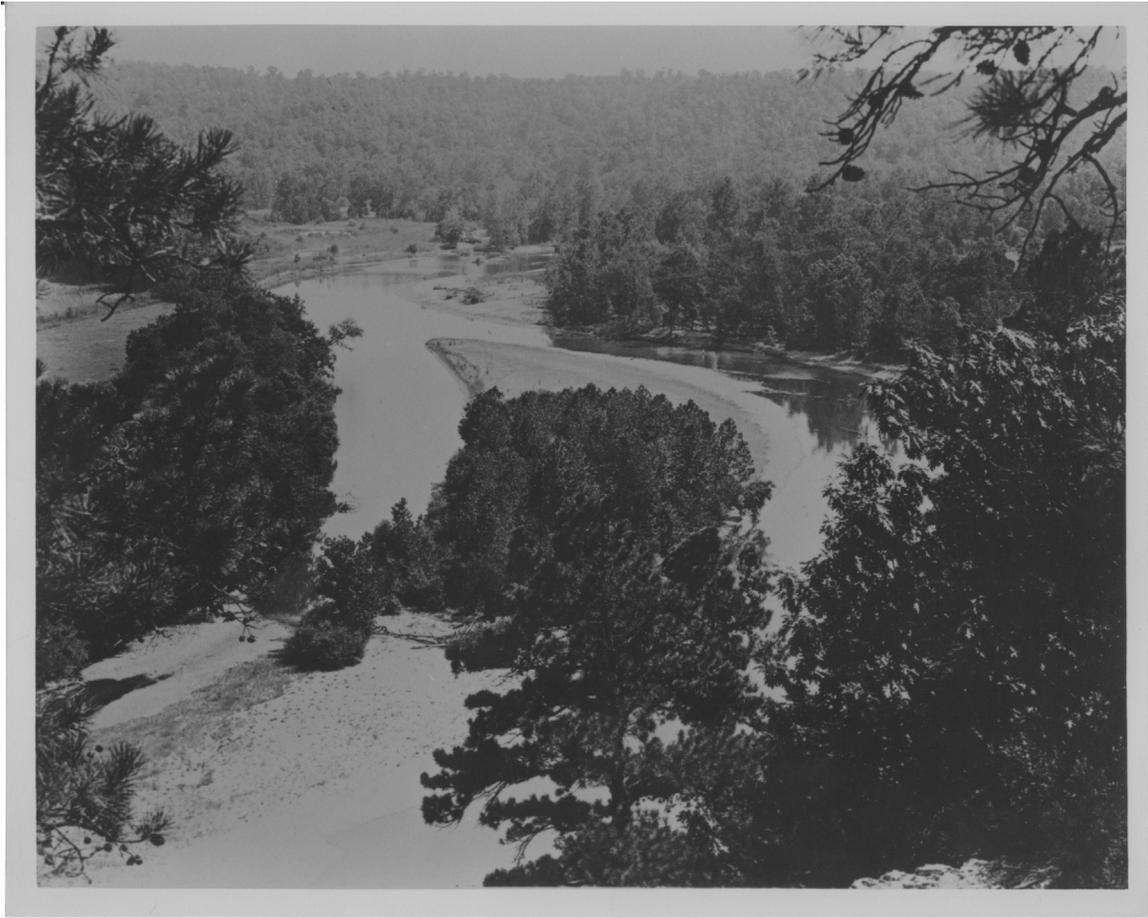


Exhibit 9: Illinois River from Eagle Bluff showing floaters in a john boat



Exhibit 10: Highway 10 along Illinois River (pre-1930)

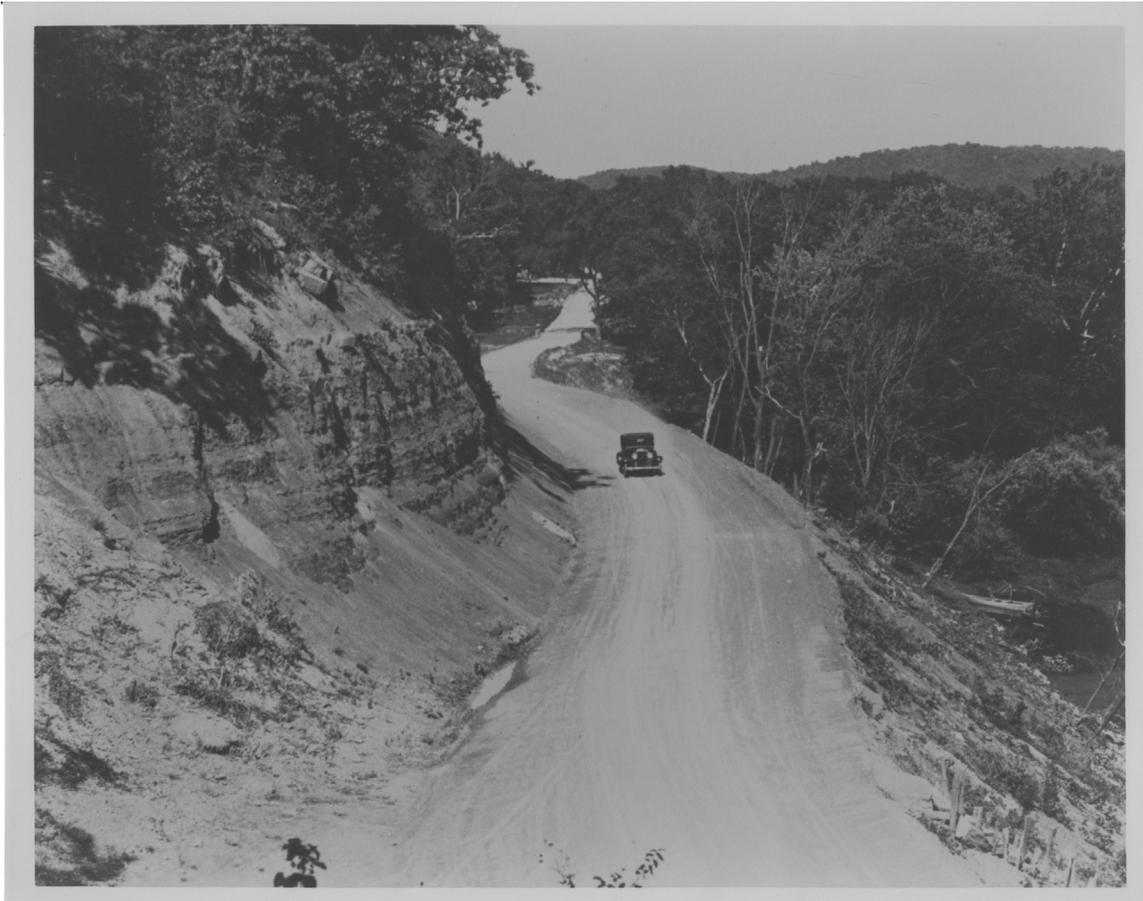


Exhibit 11: Illinois River corridor (pre-1930)

