LAND USE

Historically, the basin was dominated by tall grass prairies and narrow oak-hickory (Quercus spp.-Carya spp.) forests along major streams (Schroeder 1983). Extensive forests occurred within the Ozark Plateau region. The extent of presettlement prairie for counties within the basin is presented in Table 3. Rich agricultural land, range land, timber, minerals, food, water and transportation were essential to the settlement of the basin.

Osage Indians were the first historical inhabitants of the basin. The area became U.S. territory in 1803 as part of the Louisiana Purchase. The Osage tribe began relinquishing their land in 1808. Harmony Mission was founded on the lower Marais des Cygnes River in 1821 by the United Foreign Missionary Society, but was abandoned by 1837 (McDermott 1940, 1944). Between 1825 and 1832, treaties were negotiated and all Indian tribes were relocated to Kansas (USDA 1970, Rafferty 1980).

The first settlers of European descent were French. They arrived before the Louisiana Purchase seeking furs and minerals. Missouri acquired statehood in 1821 and a rush of settlers began 10 years later. Most were of Scotch-Irish descent and immigrated from Tennessee, Kentucky, Virginia and the Carolinas. Settlements were along major transportation routes, including the Osage River, Marais des Cygnes River, Marmaton River, Weaubleau Creek, Monegaw Creek and Clear Creek (McDermott 1940, 1944, USDA 1970, Rafferty 1980, COE 1991).

German farmers and immigrants from northern Europe began agricultural development of the basin. They cleared riparian forests, grew corn, wheat, oats, barley, flax and tobacco, and raised livestock. They also began farming the undeveloped western prairie (National Historical Company 1883, USDA 1970).

Warsaw and Osceola became important pre-Civil War trade and export centers. The Osage River became a navigation route by 1830 and Warsaw became the main port on the upper river. Osceola was reached only during high water (McDermott 1940, 1944, USDA 1970, Rafferty 1980).

The region suffered heavily during the Civil War. Warsaw and Osceola were burned, and the area population declined. After the Civil War, railroad construction brought commercial agriculture, corporate mining and lumbering, prosperity, energy and money, and increased immigration. By the late 1800s, railroad companies had built bridges across the Osage River in St. Clair County (USDA 1970, Rafferty 1980, Sprunk and Hendrickson 1980).

Forests were logged to increase farm land and supply building material, wood for fuel and lumber for exporting. The first saw mill on the Marmaton River was built in 1835 near Balltown in northeastern Vernon County (Pat Brophy, personal communication). A saw and grist mill was erected on Weaubleau Creek in 1845 and the first saw mill built on the Marais des Cygnes River was at Papinsville in 1852. Lumbering boomed in the late 1800's and several mills operated along the Osage River in St. Clair County (National Historical Company 1883, Atkenson 1918, Rafferty 1980, Sprunk and Hendrickson 1980).

Several minerals were mined within the basin. These included coal, limestone, galena (the principal lead ore), iron, copper and nickel. Coal mining became an important industry with the development of road and rail

transportation routes in the 1880's. Coal was taken from shaft mines until the development of surface mining (National Historical Company 1883, USDA 1970, Sprunk and Hendrickson 1980).

The first effort to claim bottom lands for farming in Bates County was in the early 1870's along Miami Creek near Cornland. Captain A.B. Dickey dug drainage ditches and built levees to prevent flooding of his land, but the attempt failed when flood waters washed away the levees (Atkenson 1918). The lower 44 miles of the Marais des Cygnes River and the lower 4.5 miles of Miami Creek were channelized in the early 1900s. The extent of wetland losses in the basin are unknown but are probably similar to the statewide estimated loss of 87% that has occurred since the 1780s (Dahl 1990).

In the early 1900s, the Osage River was considered a commercial fishery. Carp, drum, black bass, catfish, sturgeon and eels were sold at the larger markets. Excellent fishing for walleye, black bass, channel catfish, bluegill, crappie, flathead catfish, buffalo, carp and drum occurred on Weaubleau, Hogles, and Bear creeks. Paddlefish were popular with snaggers but were not considered food for most people (some used them as hog feed) (St. Clair County Courier 1977, Sprunk and Hendrickson 1980).

The basin is rural. The populations of the counties and largest communities (population >1000) are listed in Tables 4 and 5. Camp Clark, a 1,240 acre National Guard training facility located near Nevada, is the only military installation within the basin.

The economy of the basin is based primarily on agriculture, forest products, mining, and lake-oriented recreation and tourism. General land use information for the major watersheds (NRCS 1987) and counties (Loelkes et al. 1983) within the basin is presented in Tables 6 and 7. Physiographic characteristics of the region have determined land use practices within the basin.

Agriculture is the major land use within the basin (Tables 6 and 7). Agriculture accounts for 91% and 82% of the land use in Bates and Vernon counties, respectively (both within the Osage Plains region) (Table 7). St. Clair County (1/2 Osage Plains and 1/2 Ozark Plateau) is 57% agricultural land (Table 7). This relative decrease of agricultural land in St. Clair (and other counties) results, in part, from flooding of prime agricultural bottomland by Truman Lake, Pomme de Terre Lake, Stockton Lake and Lake of the Ozarks.

Principal row crops, in decreasing order of total acres harvested for Bates, St.Clair, and Vernon counties, are: soybeans, wheat, corn and sorghum (Table 8). Acreage of major crops within these counties decreased 7%, and fertilizer usage increased 88% between 1960 and 1991 (Tables 8 and 9). Pasture (grazed areas with nonnative, or planted vegetation; i.e. fescue) and hay land account for a substantial amount of agricultural acreage, whereas range land (grazed areas with native vegetation; i.e. native prairie grasses) is practically nonexistent (Tables 6, 7, 8 and 9). Hay acreage increased 62% between 1960 and 1991, and pasture decreased 16% between 1959 and 1987 (Tables 8 and 9). Woodland pasture totaled 821,224 acres in 1990, a 104% decrease from 1959 (Missouri Department of Agriculture [MDA] 1992). Beef cattle are the dominant livestock within the Basin, followed by swine and dairy cattle (Table 8). Livestock numbers increased 3% between 1960 and 1991 (Table 8).

Forests are another major land use within the basin (Tables 6 and 7). Most forested areas are within the Ozark Plateau region (St. Clair, Cedar, Benton, Hickory and Polk counties). Forest acreage in major counties decreased 17% between 1959 and 1972, then increased 34% between 1972 and 1989. Forests increased 11% between 1959 and 1989 (Hahn and Spencer 1991).

Several mineral deposits are scattered throughout the basin. Principal minerals include coal and limestone. Less developed, but potentially significant deposits of petroleum
(primarily Vernon County), sand, gravel, sandstone, barite, clay, and shale also occur (USDA 1970, COE 1985).

Major coal deposits occur in Bates and Henry counties. Smaller deposits lie within Vernon, Barton, Cedar and St. Clair counties (USDA 1970, COE 1985). Currently, strip mining for coal occurs within the Drywood, Marais des Cygnes River, and Monegaw subbasins. Dry Wood, Walnut, Mulberry and Monegaw creeks, plus most of their tributaries, are affected by drainage from past and present coal mined lands (MDNR 1992a). Reclamation by mining companies immediately after mining is now required (MDNR 1992a).

A survey was conducted by MDNR (1976-1981) on past and present mining within the state. Basin information for Barton, Bates, St. Clair and Vernon counties is presented in Appendix

B and summarized in Table 10. Mined areas as pollution sources are discussed in the Water Quality and Use section, and incorporated on subbasin maps (Appendix C).

The basin currently has two Special Area Land Treatment (SALT) projects. The Hogles Creek watershed project in Hickory County began in 1992 and is expected to be implemented by the end of 1993 (David Wright, personal communication). Approximately 5,300 acres of the 8,878 acre watershed require treatment (1992 MDNR information). The North Fork of Gallinipper Creek watershed project in St. Clair County, approved in 1993, began in 1994 (1993 MDNR information). No PL-566 or EARTH projects have been planned or implemented in the basin.

A substantial amount of cropland within the basin is currently in the Conservation Reserve Program (CRP) (Table 9). Vernon County has the largest amount of CRP land (55,337 acres; 39% of the county's cropland), followed by Bates (36,431 acres; 25% of the county's cropland) and Barton (35,058 acres; 25% of the county's cropland) (Table 9).

There are 45 public use areas totaling 36,978 acres within the basin (Table 11, Appendix C). These include 25 conservation areas, seven recreation areas, five stream access sites, two state parks, two natural areas, one state historical site, one visitors center, one Boy Scout camp and one wet prairie natural area managed by The Nature Conservancy. There are approximately 110,000 public use acres associated with the Harry S. Truman project, half of which (55,000 acres) are leased to the Department of Conservation. The COE retains control of the balance (Bob Marchi, COE, personal communication).

The Department manages 31 areas totaling 28,937 acres. Schell-Osage C.A. is the largest with 8,633 acres of land and 8.2 miles of Osage River frontage. Four Rivers C.A. is the second largest area with 6,558 acres of land and 17.3 miles of stream frontage along five major streams. Locations of Department areas associated with streams are presented on gradient plots (Appendix A).

CORPS OF ENGINEERS JURISDICTION

The Basin is under jurisdiction of the Kansas City District of the U.S. Army Corps of Engineers. Applications for 404 permits should be directed to:

Kansas City District, Corps of Engineers
700 Federal Bldg.
Kansas City, MO 64106
816/426-3201

Table 3. Presettlement prairie for counties within the West Osage River Basin in west-central Missouri (Schroeder 1983).

COUNTY	AREA (mi^2)	% OF LAND IN PRAIRIE
Barton*	511	86[1]
Bates	653	78
Benton*	184	25
Cedar*	172	35
Henry*	502	68
Hickory*	97	24
Polk*	158	25
St.Clair	297	43
Vernon	615	73

[1]Largest percentage of prairie in any Missouri county.

*Less than half of the county is within the West Osage River Basin.

Table 4. Population of counties in the West Osage River Basin in west-central Missouri (USDC, Bureau of the Census).

COUNTY	1980 POPULATION	1990 POPULATION	1990/1980 % CHANGE
Barton*	11,292	11,312	+ 0.2
Bates	15,873	15,025	- 5.3
Benton*	12,183	13,859	+13.8
Cedar*	11,894	12,093	+ 1.7
Henry*	19,672	20,044	+ 1.9
Hickory*	6,367	7,335	+15.2
Polk*	18,822	21,826	+16.0
St.Clair	8,622	8,457	- 1.9
Vernon	19,806	19,041	- 3.9
Total	124,531	128,992	+ 3.6

*Less than half of the county is within the West Osage River Basin.

Table 5. Largest communities (population >1,000), population (USDC, Bureau of the Census 1990 figures), county, and subbasin(s) in which they are located for communities in the West Osage River Basin in west-central Missouri.

COMMUNITY	POPULATION	COUNTY	SUBBASIN(S)
Nevada	8,597	Vernon	Dry Wood & Marmaton
Butler	4,099	Bates	Marais des Cygnes
El Dorado Springs	3,896	Cedar	Clear Creek
Rich Hill	1,317	Bates	Marais des Cygnes & Marmaton
Appleton City	1,280	St.Clair	Monegaw Creek

Table 6. Natural Resources Inventory derived land use and estimates of land cover acreage of nonfederal lands and small waters (SCS 1997).

HYDROLOGIC UNIT	CROPLAND	PASTURE*	RANGE LAND*	FOREST LAND	MINORLAND COVER/USE
MARMATON					
1987 Acres**	**245.3 (74.2%)**	**41.7 (12.6%)**	**0 (0%)**	**21.3 (6.5%)**	**1.6 (0.5%)**
1982 Acres**	**242.9 (73.5%)**	**39.4 (11.9%)**	**4.8 (1.5%)**	**21.5 (6.5%)**	**1.4 (0.4%)**
LOWER MARAIS DES CYGNES RIVER					
1987 Acres**	**90.5 (39.4%)**	**120.3 (52.4%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**
1982 Acres**	**94.0 (41.0%)**	**116.9 (50.9%)**	**0 (0%)**	**0 (0%)**	**0 (0%)**
LOWER OSAGE					
1987 Acres**	**125.0 (77.7%)**	**24.9 (15.5%)**	**0 (0%)**	**0 (0%)**	**5.7(3.5%)**
1982 Acres**	**102.2 (63.5%)**	**45.3 (28.2%)**	**2.4 (1.5%)**	**0 (0%)**	**5.8 (3.6%)**
HARRY S TRUMAN RESERVOIR					
1987 Acres**	**256.4 (30.4%)**	**273.4 (32.4%)**	**0 (0%)**	**280(33.2%)**	**10.8(1.3%)**
1982 Acres**	**284.3 (33.7%)**	**203.2 (24.1%)**	**42.8 (5.1%)**	**280 (33.2%)**	**10.7 (1.3%)**

HYDROLOGIC UNIT	BUILD-UP & URBAN LAND	RURAL TRANSPORTATION	SMALL WATER AREAS	TOTAL
MARMATON				
1987 Acres**	**5.6 (1.7%)**	**8.7 (2.6%)**	**6.3 (1.9%)**	**330.5**
1982 Acres**	**5.5 (1.7%)**	**8.7 (2.6%)**	**6.3 (1.9%)**	

LOWER MARAIS DES CYGNES RIVER				
1987 Acres**	**3.5 (1.5%)**	**15.1 (6.6%)**	**0.1 (0.04%)**	**229.5**
1982 Acres**	**3.5 (1.5%)**	**15.1 (6.6%)**	**0 (0%)**	
LOWER OSAGE				
1987 Acres**	**0 (0%)**	**0 (0%)**	**5.3 (3.3%)**	**160.9**
1982 Acres**	**0 (0%)**	**0 (0%)**	**5.2 (3.2%)**	
HARRY S. TRUMAN RESERVOIR				
1987 Acres**	**1.8 (0.2%)**	**17.9 (2.1%)**	**2.4 (0.3%)**	**160.9**
1982 Acres**	**1.5 (0.2%)**	**17.9 (2.1%)**	**2.3 (0.3%)**	

*** Pasture includes areas of non-native, or planted vegetation; range land includes areas of native vegetation.**

**** Figures are in thousands of acres.**

Table 10. Summary of mining inventory for selected counties (Barton, Vernon, Bates, and St. Clair) within the West Osage River Basin of west-central Missouri. Survey was conducted by MDNR 1976-1981; data are from references dated to 1850. (Apendix B)

PRESENT MINING			
COUNTY	COAL	LIMESTONE	PETROLEUM
BARTON			
Acres	0	0	11
Locations	0	0	1
VERNON			
Acres	547+	NA	0
Locations	3	3	0
BATES			
Acres	NA	168	0
Locations	1	2	0
ST CLAIR			
Acres	0	0	0
Locations	0	0	0

TOTAL			
Acres	547+	168+	11
Locations	4	5	1

Table 10. Continued.

PAST MINING									
COUNTY	**COAL**	**LIMESTONE**	**SAND/ GRAVEL**	**CLAY**	**SANDSTONE**	**LEAD**	**ZINC**	**IRON**	**BARIUM**
BARTON									
Acres	7,600	8	0	N/A	N/A	N/A	0	0	0
Locations	46	2	0	1	1	3	0	0	0
VERNON									
Acres	1,204+	72+	0	6.5+	0	0	0	0	0
Locations	61	5	0	4	0	0	0	0	0
BATES									
Acres	7,851+	120+	11+	0	0	0	0	0	0
Locations	32	30	6	0	0	0	0	0	0
ST CLAIR									
Acres	1,620+	90+	1	1	0	0	N/A	N/A	2
Locations	122	15	1	1	0	0	1	2	1
TOTAL									
Acres	**18,275+**	**290+**	**12+**	**7.5+**	**N/A**	**N/A**	**N/A**	**N/A**	**2**
Locations	**261**	**52**	**7**	**6**	**1**	**3**	**1**	**2**	**1**

Table 11. Public use areas within the West Osage River Basin. Frontage includes third order and larger treams.

AREA (OWNERSHIP)	ACRES	FRONTAGE (mi)	MAJOR STREAM(S)	BOAT RAMP ON STREAM
WEAUBLEAU SUBBASIN				
Kings Prairie Access (MDC)	281	1.2	Weaubleau Creek	No
MONEGAW SUBBASIN				
Schell-Osage C.A. (MDC)	8,633	8.2	Osage River	Yes[1]
Taberville Prairie C.A. (MDC)	1,680	--	--	No
Dave Rock Natural Area (MDC)	133	--	--	No
Lichen Glade C.A. (MDC)	26	--	--	No
Subtotal	**10,472**	**8.2**		
CLEAR CREEK SUBBASIN				
Clear Creek C.A. (MDC)	370	1.4	Clear Creek	No
Wah-Kon-Tah Prairie C.A. (MDC)	2,332	--	--	No
MO-KO Prairie C.A. (MDC)	420	--	--	No
Monegaw Prairie C.A.(MDC)	270	--	--	No
Risch (E.B.& M.O.) C.A. (MDC)	163	--	--	No
Catlin Prarie C.A. (MDC)	160	--	--	No
Gay Feather Prairie C.A.(MDC)	116	--	--	No
Subtotal	**3,831**	**1.4**		
MARIS DES CYGNES RIVER SUBBASIN				
Old Town Access (MDC)	310	1.3	Bates Co. Drainage Ditch	Yes
		1.2	Maris Des Cygnes	No
Ripgut Prairie Natural Area (MDC)	280	0.3	Bates Co. Drainage Ditch	No
Subtotal	**590**	**2.8**		
MARMATON SUBBASIN				
Harmony Mission C.A. (MDC)	1,080	--	--	No
Marmaton Bottoms Wet Prairie N.A. (TNC)	304	0.5	Marmaton River	No
Peabody C.A. (MDC)	299	----	--	No
Flight Lake C.A. (MDC)	159	----	--	No
Douglas Branch C.A. (MDC)	511	0.4	Douglas Branch	No
Cephas Ford Access (MDC)	107	1.1	Marmaton River	Yes
Osage Village S.H.S. (DNR)	100	----	--	No

Table 11. Continued.

AREA (OWNERSHIP)	ACRES	FRONTAGE (mi)	MAJOR STREAM(S)	BOAT RAMP ON STREAM
Four Rivers C.A. (MDC)	13,671	6.4	Marmaton River	Yes[1]
		4.0	Little Osage	No
		3.2	Marais des Cygnes	No
		0.4	Bates Co. Drainage Ditch	No
		3.3	Muddy Creek	No
Gama Grass Prairie C.A. (MDC)	80	--	--	No
Subtotal	**16,311**	**19.3**		
DRY WOOD SUBBASIN				
Bushwhacker Lake C.A. (MDC)	4,125	5.1	L Dry Wood Creek	No
Prairie State Park (DNR)	2,558	0.4	Second Nicolson Ck	No
		0.7	Fleck Creek	No
		0.9	First Nicholson Ck	No
Osage Prairie C.A. (MDC)	1,506	--	--	No
Buffalo Wallow Prairie C.A. (MDC)	320	--	--	No
Redwing Prairie C.A. (MDC)	160	---	--	No
Tzi-Sho Prairie C.A. (MDC)	160	--	--	No
Hunkah Prairie C.A. (MDC)	160	--	--	No
Davis Memorial S.F. (MDC)	85	--	--	No
Little Osage Prairie	80	--	--	No
Big Dry Wood Creek C.A. (MDC)	12	0.2	Dry Wood Creek	No
Subtotal	9,166	7.3		
TRUMAN LAKE				
Kaysinger Bluff V.C. (COE)	150	--[2]	Osage River	No
Harry S. Truman S.P. (DNR)	1,440	--[2]	Osage River	Yes
Shawnee Bend R.A. (COE)	540	--[2]	Osage River	Yes
Osage Bluff R.A. (COE)	565	--[2]	Osage River	Yes

Table 11. Continued.

AREA (OWNERSHIP)	ACRES	FRONTAGE (mi)	MAJOR STREAM(S)	BOAT RAMP ON STREAM
Berry Bend R.A.	624	--[2]	Osage River	Yes
Talley Bend R.A. (COE)	260	--[2]	Osage River	Yes
Brush Creek R.A. (City of Osceola)	47	--[2]	Osage River	Yes
Crowe's Crossing R.A. (COE)	70	--[2]	Osage River	Yes
Osceola R.A. (City of Osceola)	520	--[2]	Osage River	Yes
Roscoe Access (Village of Roscoe)	193	--[2]	Osage River	Yes
Taberville Access (MDC)	5	--[2]	Osage River	Yes
H. Roe Bartle Scout Reservation (Boy Scouts)	670	--[2]	Osage River	No
Subtotal	5,084	**--[2]**		
TOTAL	**45,735**	**40.2+[2]**		

[1] Planned development within five years.
[2] Frontage waries with lake elevation.

COE - Managed by US Army Corps of Engineers
6 areas; 2,209 acres; frontage varies with lake elevation

DNR - Managed by Missouri Department of Natural Resources
3 areas; 4,098 acres; 2+ mi of frontage (varies with lake elevation)

MDC - Managed by Missouri Department of Conservation
31 areas; 28,937 acres; 37.7+ mi frontage (varies with lake elevation)

TNC - Managed by The Nature Conservancy
1 area; 304 acres; 0.5 mi frontage

Osceola - 2 areas; 567 acres; frontage varies with lake elevation

Roscoe - 1 area; 193 acres; frontage varies with lake elevation

Boy Scouts - 1 area; 670 acres; frontage varies with lake elevation

C.A. -- Conservation Area
N.A. -- Natural Area
R.A. -- Recreation Area
S.F. -- State Forest
S.H.S. -- State Historic Site
S.P. -- State Park
V.C. -- Visitor Center

Sources:
Outdoor Missouri Map (MDC 1988)
HST Dam and Reservoir, Master Plan (COE 1988)
Prairie State Park Pamphlet (DNR)
Public Prairies of Missouri (Toney 1987)
Presettlement Prairie of Missouri (Schroeder 1983)