LAND USE

Historic and Recent Land Use

The presettlement Grand River Basin was characterized by long narrow prairies generally oriented north-south and divided by timbered ridge tops and stream valleys (Schroeder 1982). Only in the southwest part of the basin did prairies open up to wide expanses averaging one or two miles across.

Schroeder (1982) describes the riparian areas common to the basin.

> "In addition to the upland prairies, bottomland prairies occurred regularly on the flood plains of streams, sometimes becoming so extensive that timber was restricted to the river bank and rougher valley slopes.
>
> Large areas of the broad flood plains of streams in the Grand-Chariton region supported a `luxuriant growth of coarse wild grass' (Watkins et al. 1921). Sometimes these wet prairies occupied the entire bottomland, except for a timber strip fringing the banks of streams. Clay or gumbo soils prevented good drainage, and marshes and ponds abounded.
>
> Survey notes reveal a complex pattern of small lakes or ponds, wet prairie, intensively meandering creeks with and without river bank timber, and dense timber only along the Grand River channel in northwest Chariton County in what is now the Swan Lake area. There was nothing but wet prairie at the present Swan Lake site."

The first European settlers came to the Grand River region in 1817. However, extensive settlement did not begin until after 1830 (Boehner 1937). Much of the agricultural activity was related to clearing trees for firewood and row crop production. Prairie areas, especially those near streams were not farmed because primitive implements could not plow the tough soil. Early settlers also believed that land that did not grow trees could not grow crops (Boehner 1937). Grazing and timber clearing probably had the most impact on streams during this time.

In 1835, the Missouri State Legislature declared Grand River to be navigable to the Iowa state line, but steamboat navigation was never possible much above Chillicothe (Boehner 1937). There are accounts of steamboats making trips up the Grand River as far as the vicinity of Utica and Breckenridge (Livingston County) in the period of 1842-1865 (Boehner 1937). The steamer trips up the Grand River often experienced long delays due to low water conditions and navigation hazards. The town of Bedford in Livingston County derived its name from a steamer of that name that struck a log and was wrecked beyond repair during low water on the Grand River 12 miles southeast of Chillicothe (Boehner 1937). In the 1848-49 session, the General Assembly appropriated $200,000 to improve Grand River for navigation (Birdsell and Dean 1882). Much of that activity was probably snag removal. By 1886, the use of channelization, jetties, and rip-rap was being considered to facilitate navigation and

improve the floodplain for farming (St. Louis National Historical Co. 1886).

In the late 1800's and early 1900's limited channelization was done using pilot channels (USCOE 1963). Around 1915, channelization became a common practice (Wells 1948). Drainage districts were formed to cooperate on stream channelization projects. Much of the early channelization was done in the upper reaches of the Grand River. In Grundy County, channels were dug in all of the major rivers and streams by the 1920's (USDA-SCS 1990). No organized maintenance has been done since the early 1950's (USDA-SCS 1990). The rapid accumulation of sediment in the lower Grand River decreased the channel capacity. Channelization projects were then undertaken in the lower portion of the basin to solve the resulting floods (Wells 1948).

The 1970's and 1980's are considered the private levee construction periods (USDA-SCS 1982). Rising land prices and the increased availability of heavy equipment made levees an attractive alternative along streams even without federal cost share assistance. Today channelization and levee construction are viewed by landowners as legitimate stream management practices throughout the basin. Since 1915, approximately 50 drainage districts and 10 privately-financed organizations have spent more than $10,000,000 on channel straightening, drainage facilities, and levees to protect 385,000 acres of land. However, the construction of the various projects was not coordinated and they provide differing levels of protection (USCOE 1989).

The basin has been described as a "typical Midwestern rural area with scattered small towns and a low population density" (USDA-SCS 1982). There are no major urban areas within the basin. Chillicothe (pop. 9,000), Trenton (pop. 6,129), Brookfield (pop. 4,888), Cameron (pop. 4,831), Carrollton (pop. 4,406), Bethany (pop. 3,005), Lamoni, Iowa (pop. 2,705), and Greenfield, Iowa (pop. 2,074) are the major towns within the Grand River Basin.

Land use in the Missouri portion of the Grand River Basin is estimated to be 92% agricultural and 5% forest (Table 1) (Figure 4, Lower Grand, Middle Grand, and Upper Grand sub-basins).

Soil Conservation Projects

Missouri has approximately 1.3 million acres (26%) of the basin within Watershed Protection and Flood Prevention Act (Public Law 83-566) watershed projects (USDA-SCS 1993). The Panther Creek Watershed project in Harrison County, is the first completed PL-566 project. Ten other projects within the basin are in various stages of planning and construction (Table 2).

Special Area Land Treatment (SALT) projects have been initiated in the watersheds of 37 streams and lakes within the basin (Table 3). SALT projects are state-funded programs administered by local Soil and Water Conservation Districts (SWCD) to reduce soil erosion. Approximately 360,430 acres are enrolled in SALT projects throughout the Missouri portion of the basin. When all projects are completed, 4% of Missouri's portion of the basin will be treated.

Public Areas

There are 72,342 acres of public land within the Grand River Basin (Figures lp, mp, and up). A total of 54,281 acres are in Missouri with the Missouri Department of Conservation (MDC) managing approximately 56% of that land. In Iowa, 18,061 acres of the basin are in public ownership.

Management of MDC lands ranges from an intensively managed wetland area to moderately managed upland and natural areas. Opportunities for both consumptive and non-consumptive recreational activities are available on public land within the basin.

There are 22 stream access sites within the Missouri portion of the basin (Figure sa). Seven additional sites will complete MDC's stream access acquisition plan objectives (McPherson 1994). Twelve access sites on the mainstem of Grand River provide opportunities for float trips. Portions of Thompson River, Grindstone Creek, Big Creek (Harrison and Daviess counties), Grand River and Locust Creek have been highlighted as good stream reaches for floating (Pemberton 1982).

There are 27 public fishing lakes that exist or are in the planning phase (20 in Missouri, 16 in Iowa; Figure lk). Construction of a public fishing lake near Braymer, Missouri would complete MDC's public lake acquisition goal of providing close to home fishing opportunities to Missouri residents within the basin (Ryck 1991).

Corps of Engineers 404 Jurisdiction

The Missouri portion of the Grand River Basin is under the jurisdiction of the Kansas City District of the U.S. Army Corps of Engineers. The Iowa portion is administered by the Rock Island District. Applications for 404 permits should be addressed to one of the following offices:

In Missouri:

700 Federal Building
Kansas City, MO 64106-2896
Attention: MRKOD-P
816/983-3670
website: www.nwk.usace.army.mil

In Iowa:

Clock Tower Building
RockIsland,IL61201-2004
Attention: NCROD-S
309/794-5371
website:www.mvr.usace.army.mil/

Table 1. Land use in the Missouri portion of the Grand River Basin in 1987 (S. Baima, USDA-Soil Conservation Service, personal communication).

Watershed	Cropland (Acres)	Forest (Acres)	Pasture (Acres)	Other (Acres)
Upper Grand (above Chillicothe)	1,019,600	92,900	574,000	143,600
Lower Grand (below Chillicothe)	730,100	86,200	421,900	37,000
Thompson	397,600	23,600	202,000	43,200
	2,147,300	202,700	1,197,900	223,800
	(60%)	(5%)	(32%)	(6%)

Table 2. Status of PL-566 watershed projects in the Grand River Basin as of November 1993. (USDA-SCS 1993)

Watershed	Acres	Status
East Fork Big Creek	62,073	Approved for operations
Panther Creek	22,035	Project completed, January 1976
West Fork Big Creek	187,290	Approved for operations
Grindstone/Lost/Muddy Creeks	209,100	Approved for operations
Upper Locust Creek (amended) MO/IA	238,700	Approved for operations
Big/Hurricane Creeks (amended)	176,800	Approved for operations
East Yellow Creek	122,700	Approved for operations
East Fork Grand River	168,400	Active planning
East Locust Creek	78,700	Approved for operations
Little Otter Creek	6,410	Active planning
Town Branch (Albany)	6,745	Approved for operations

Table 3. Special Area Land Treatment (SALT) projects within the Missouri portion of the Grand River Basin.

District	Project Name	Watershed
Caldwell	Hamilton City Reservoir	900
Caldwell/Daviess	Lick Fork	5,700
Carroll	Little Hurricane	6,300
Carroll	Wolf Creek	4,274
Carroll	Snow Branch	2,000
Carroll/Ray	Turkey Creek AgNPS SALT	62,000
Chariton	Hickory Branch	7,824
Chariton	Upper Salt Creek	9,785
Daviess	Lake Viking	6,284
Daviess	Hog Creek	3,030
Daviess	Marrowbone/Dog/Honey Creeks	61,800
Daviess	Bear Creek	4,023
Daviess/Harrison	Tombstone Creek	12,800
DeKalb/Clinton	Grindstone Creek AgNPS SALT	13,500
Gentry	Town Branch	2,400
Gentry	Linn Creek	4,300
Gentry	Long Branch	9,000
Gentry	Walnut Fork	11,000
Grundy	Middle Creek	4,000
Grundy/Harrison	Furnace Creek	3,162
Harrison	Upper Pole Cat Creek	10,580
Harrison	Upper Little Creek	11,000
Harrison	Trail Creek	17,300
Harrison	Cypress Creek	11,600
Harrison/Grundy/Daviess	Sugar Creek AgNPS SALT	68,000
Linn	West Yellow Creek Trib.	2,320
Linn	Little Turkey Creek	6,410
Linn	Bear Branch	5,179
Linn/Chariton	Silver Lake Trib.	2,875
Livingston	Parson Creek	63,000
Mercer	Wildcat Creek	3,250
Mercer	West Muddy/Lake Paho	19,360
Sullivan	Elmwood Lake	4,164
Sullivan	West Yellow Creek	3,170
Sullivan	Yellow Creek	10,638
Worth	Jay Creek	6,000
Worth	Bear Creek	5,200
Worth	Marlowe Creek	6,000
Worth/Harrison	Little Rock Creek	5,032
Worth/Harrison	Big Rock Creek	8,770

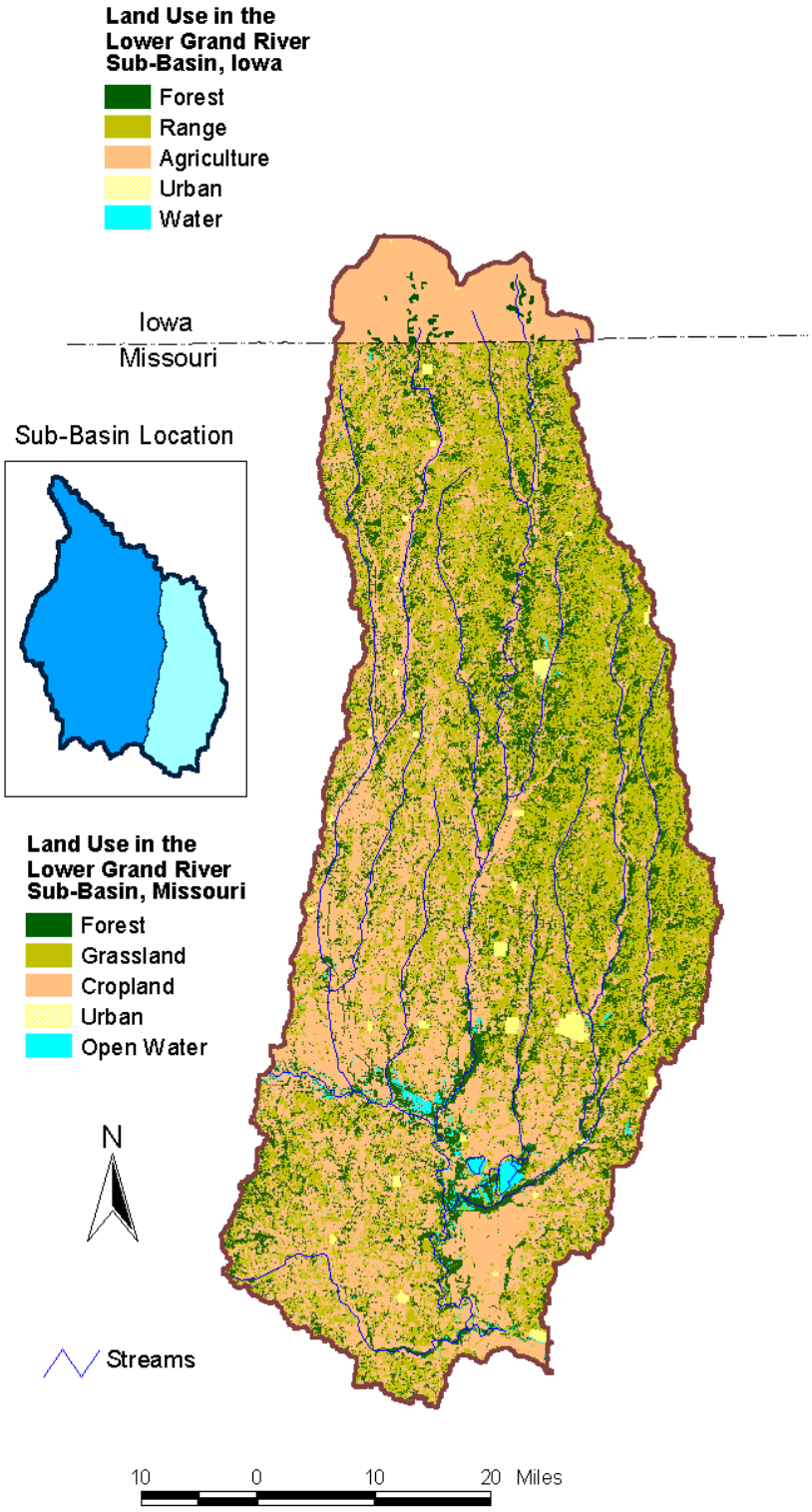


Figure 4a. Land use in the lower Grand River sub-basin in Missouri and Iowa (MORAP 1999, preliminary data).

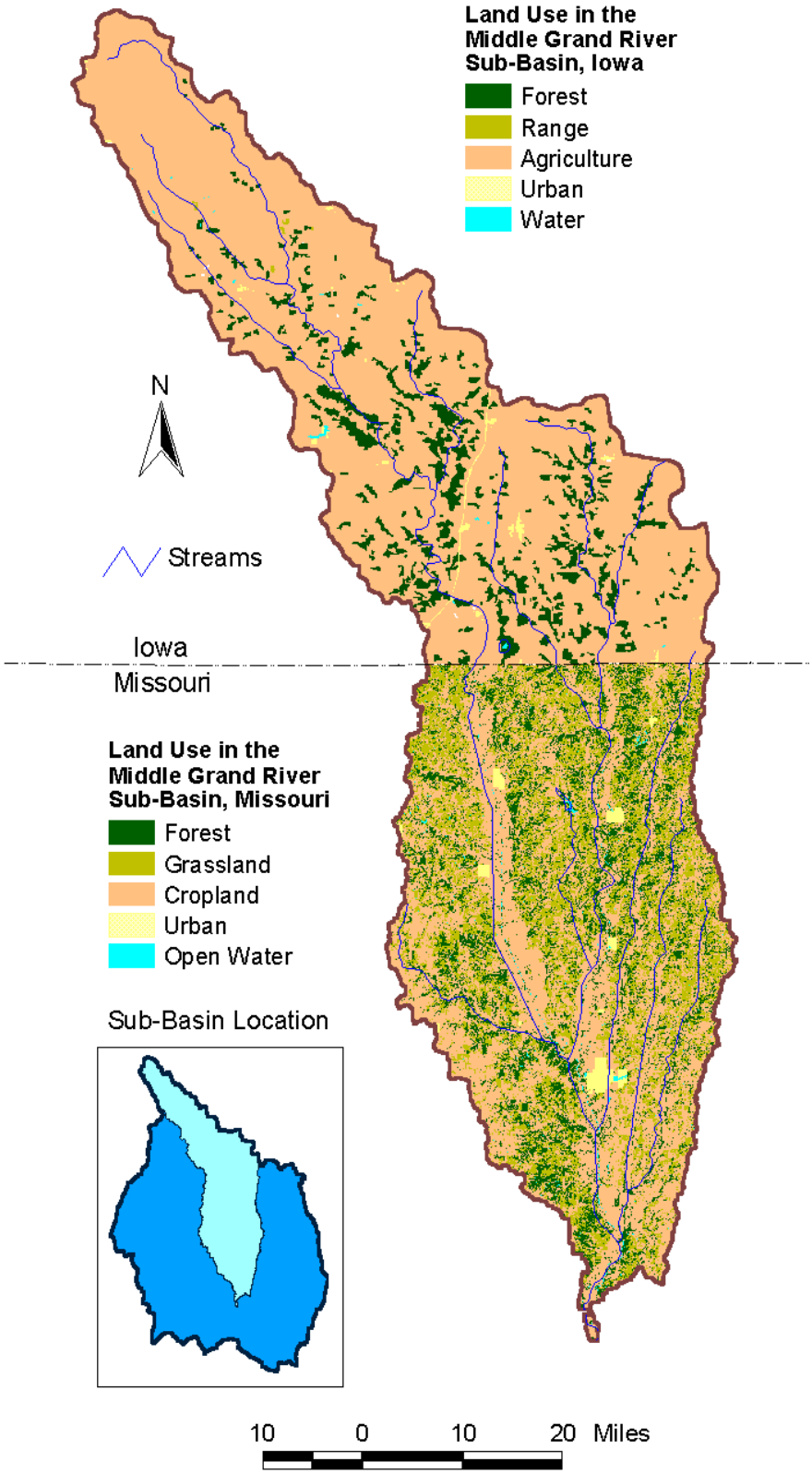


Figure 4b. Land use in the middle Grand River sub-basin in Missouri and Iowa (MORAP 1999, preliminary data).

Figure 4c. Land use in the upper Grand River sub-basin in Missouri and Iowa (MORAP 1999, preliminary data).

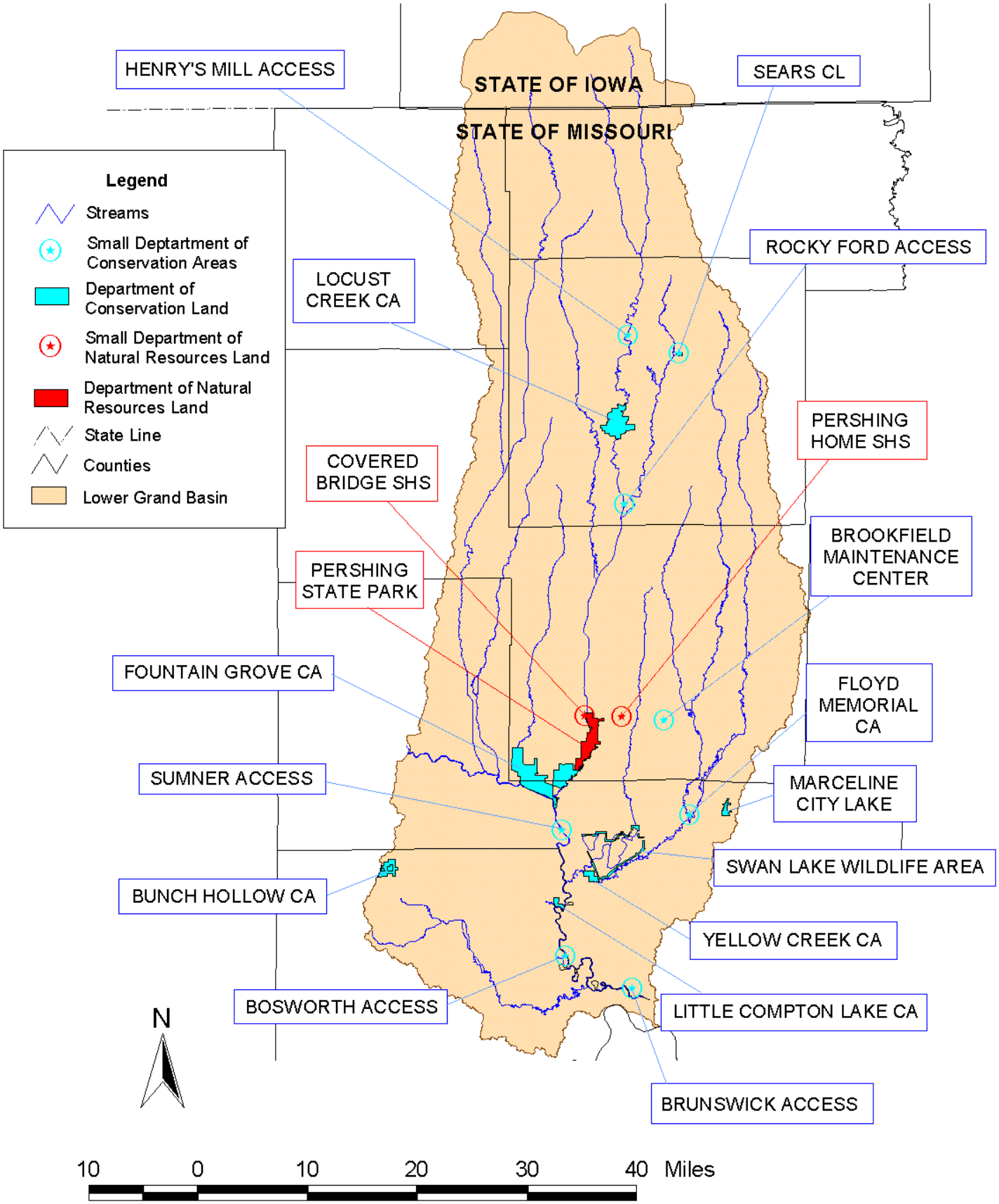


Figure lp. Public land sites within the lower Grand River Basin, in Missouri.
CA = Conservation Area. SHS = State Historic Site.

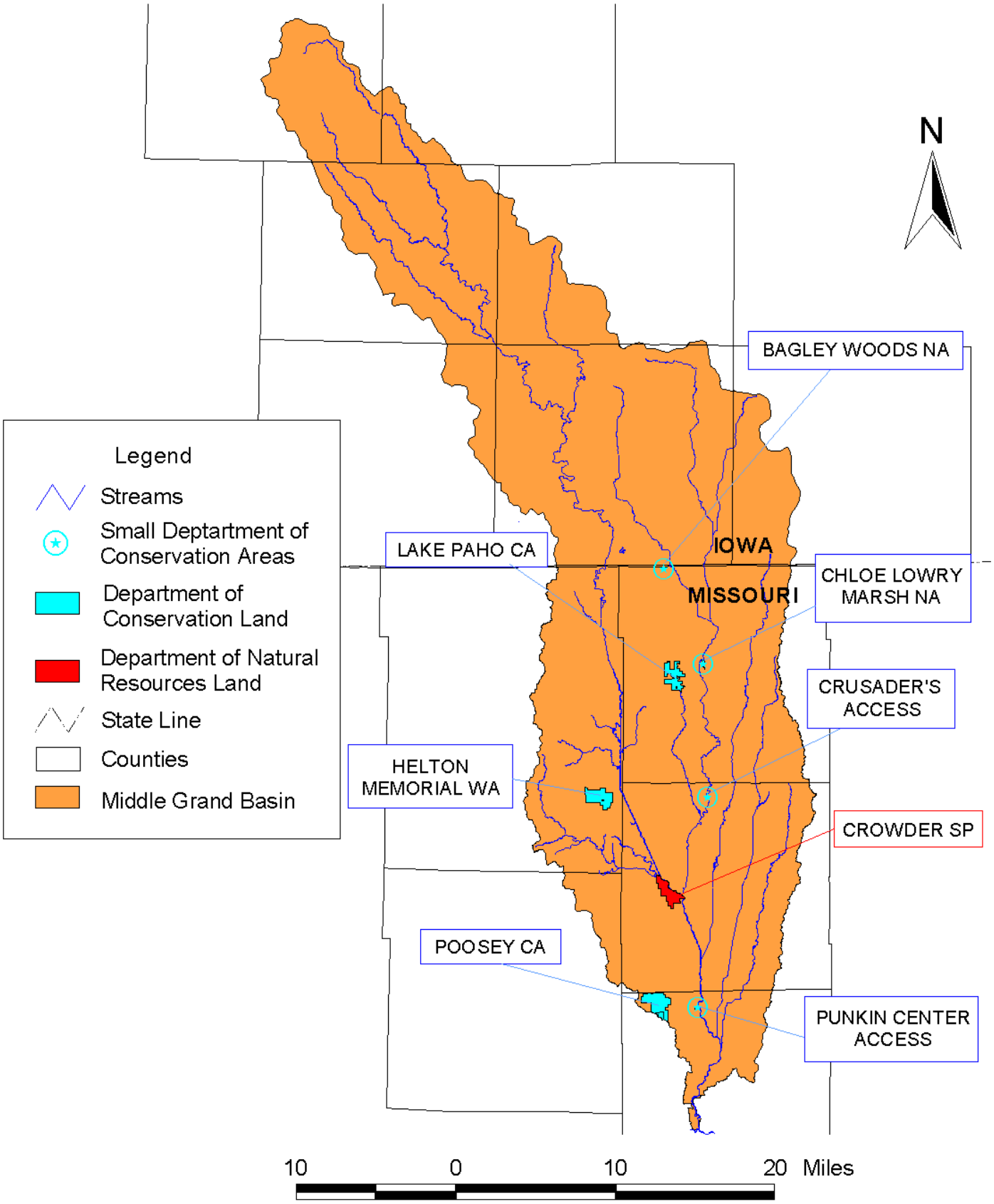


Figure mp. Public Land sites within the middle Grand River Basin, in Missouri.
CA = Conservation Area. SP = State Park. NA = Naural Area. WA = Wildlife Area.

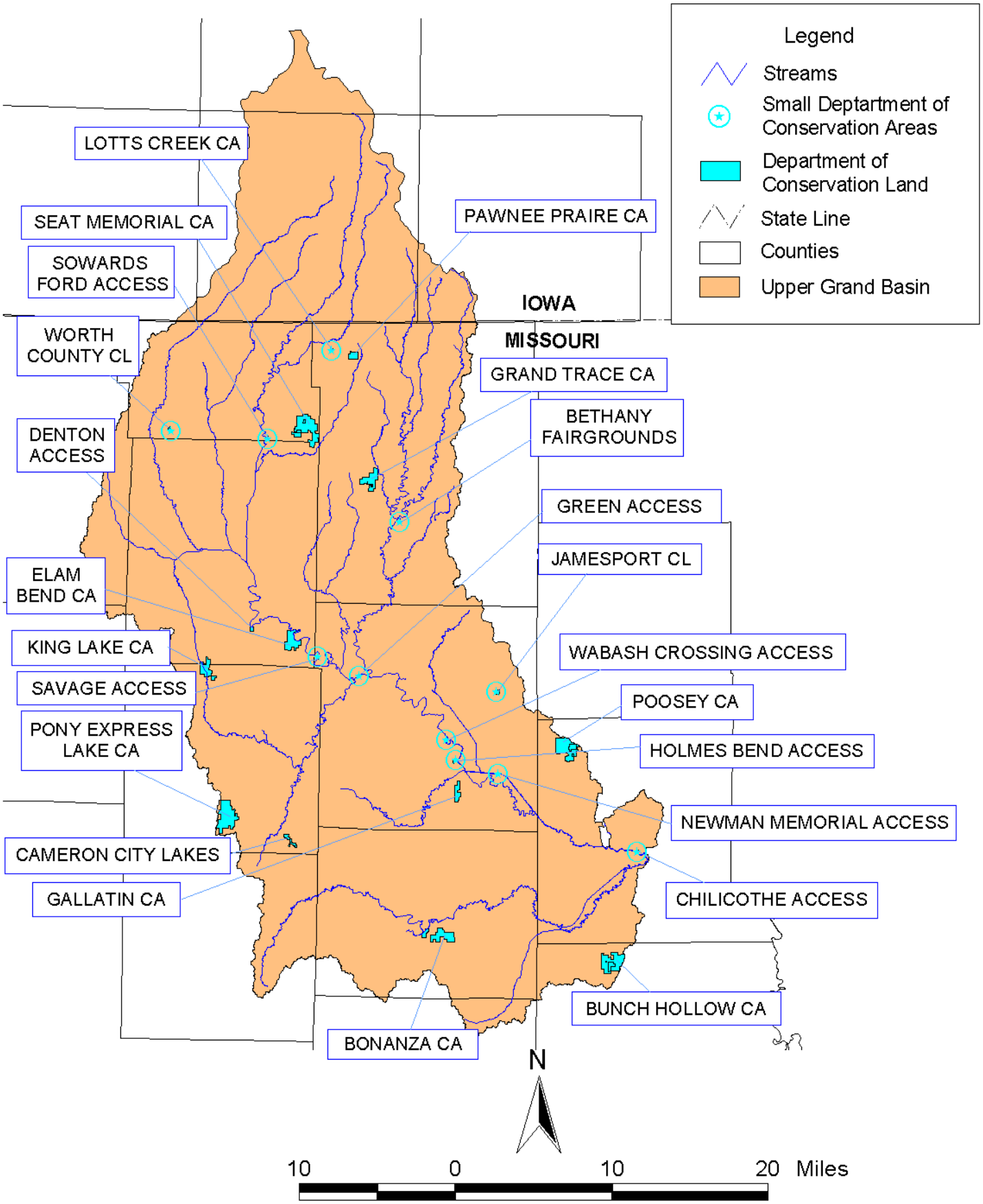


Figure up. Public land sites within the upper Grand River Basin, in Missouri.
CA = Conservation Area. CL = City Lake

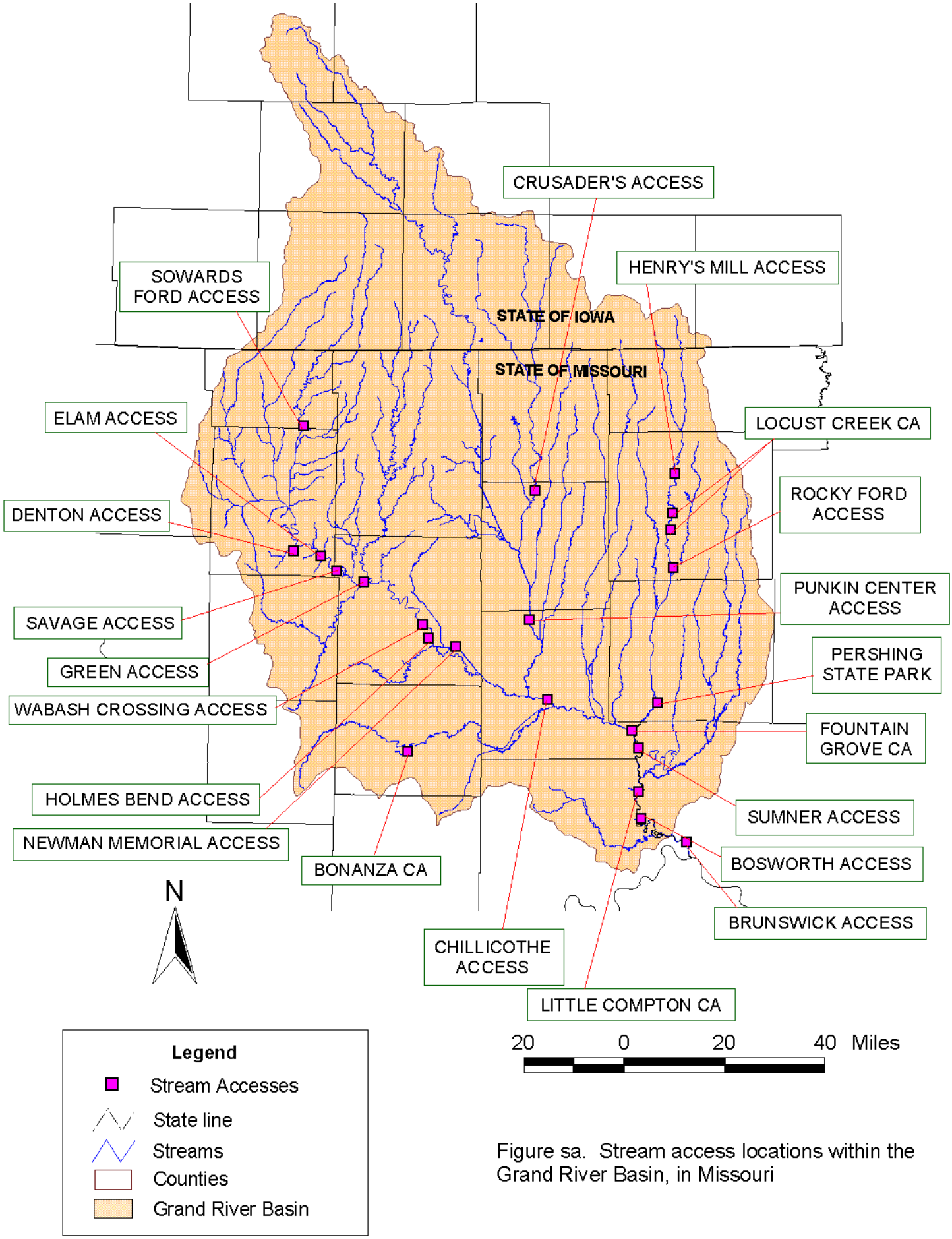
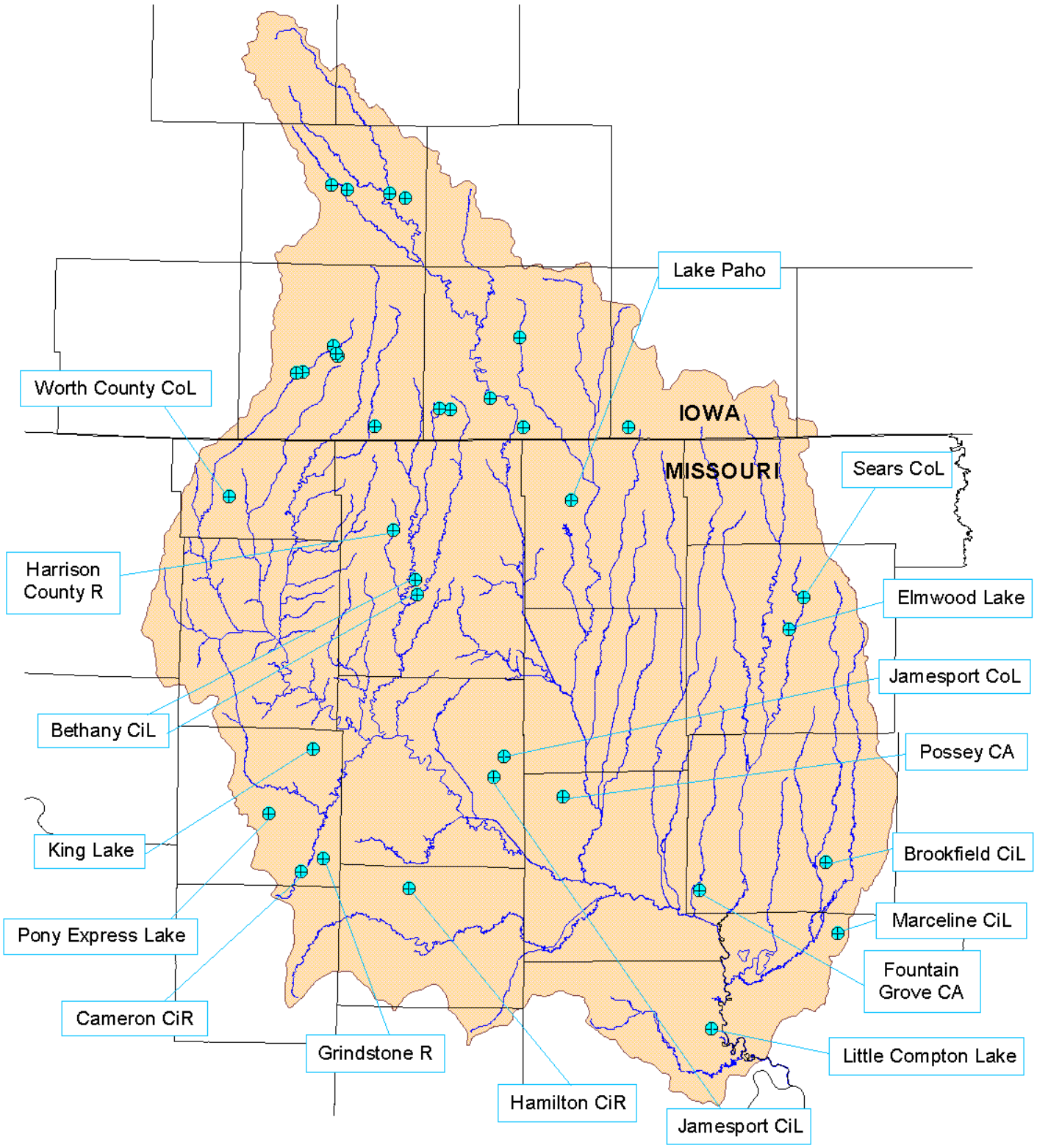


Figure sa. Stream access locations within the Grand River Basin, in Missouri



Legend

- Public Fishing Lakes
- Streams
- Counties
- Grand River Watershed

N

20 0 20 40 Miles

Figure lk. Public lakes in the Grand River Basin, in Missouri and Iowa. CA = Conservation Area. CiL = City Lake(s). CoL = Community Lake(s). R = Reservoir. CiR = City Reservoir