BIG PINEY RIVER

WATERSHED

INVENTORY AND ASSESSMENT

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EXECUTIVE SUMMARY

The Big Piney Watershed occupies an area of approximately 755 square miles in portions of 4 counties in Missouri. These counties include Texas, Howell, Phelps, and Pulaski Counties. Most of the watershed (74%) lies within Texas County, while Pulaski, Phelps, and Howell Counties contain 14%, 12%, and less than 1% of the watershed respectively. The Big Piney Watershed is bounded on the west, north and a portion of the east side by the remainder of the Gasconade Basin. The Meramec, Current, and Jacks Fork Watersheds bound the Big Piney on the remainder of the East side, while the North Fork watershed lies on its southern boundary.

The Big Piney River begins as a first order stream approximately 4 miles northwest of Cabool, Missouri. From its beginnings, the stream flows in a southeasterly direction for approximately 4 miles before entering the city of Cabool, Missouri. It then continues in a southeasterly direction for 2 miles before turning northeast and following the outskirts of Cabool for an additional 2 miles. From Cabool, the river continues in a northeasterly direction for 35 miles before turning to the North, Northeast. The Big Piney continues to follow this general direction for approximately 67 miles before emptying into the Gasconade River 2.8 river miles north of Interstate 44.

The Big Piney Watershed has 5 cities and towns within or partially within its boundary. They include Cabool, Houston, Licking, Raymondville, and St. Robert. In addition, approximately 38% of the Fort Leonard Wood Military Reservation occurs within the watershed.

The Big Piney Watershed lies within the Salem Plateau Subdivision of the Ozark Plateau Physiographic Region. The Salem Plateau Subdivision is a highly dissected plateau with upland elevations ranging from 1000 to 1400 feet above mean sea level (msl) and local relief (local relief refers to the difference in elevation between two nearby points such as a valley and an adjoining ridge top) ranging from 100 - 200 feet in the uplands to 200 - 500 feet elsewhere. Elevations within the watershed range from a maximum of approximately 1663 feet above msl in the uplands to approximately 688 feet above msl in the lower portions of the watershed. The Big Piney Watershed occurs within the Ozarks Soil Region. Eight soil associations occur within the watershed.

Ordovician dolomites and sandstone dolomites dominate the geology of the watershed, while small isolated remnants of Mississippian Limestone and Pennsylvanian Limestone occur in the upper portion of the watershed. As is the case in most watersheds of the Ozarks, the geology of the Big Piney Watershed (primarily consisting of soluble rock formations of dolomites and sandstone dolomites), in combination with an average annual precipitation of over 42 inches has created a karst landscape within the watershed. This karst landscape is characterized, in part, by a close relationship between the surface water and ground water systems. Within karst landscapes, points or areas of surface water/ground water interaction include losing streams, sinkholes, and springs.

There are 91 third order and larger streams within the watershed. These streams account for a total of approximately 602 stream miles or 30% of the total stream miles within the watershed. The Big Piney River is 110.5 miles long and becomes sixth order at the confluence of West Piney Creek.

Total drainage area of the Big Piney Watershed is 755 square miles (482,956 acres). There are 5 major subwatersheds (based on 5th order streams) within the watershed. These include the subwatersheds of Spring Creek, West Piney Creek, Arthur Creek, Big Paddy Creek, and Bald Ridge Creek.

Historical land cover within the uplands of the upper Big Piney Watershed probably consisted of open woodlands comprised of post oak and black oak with an understory of shrubs and grasses such as bluestem. Occasional savanna openings were also probably common. The more dissected areas of the uplands most likely consisted of mixed oak woodland and forest. In the more central portion of the watershed, pine and oak-pine woodlands probably occurred on the uplands underlain by sandstones of the Roubidoux Formation, while oak and oak-pine forest probably dominated the lower slopes as well as more dissected portions of this area. In valley bottoms having rich alluvial soils, a forest of mixed hardwoods likely existed. The land cover blanketing the rugged topography of the lower Big Piney watershed is believed to have consisted of oak and mixed hardwood forest open woodlands and scattered glades on exposed ridges and sideslopes with occasional fens in narrow valleys. Analysis of recent land cover data reveals that approximately 62.7% of the Big Piney Watershed is forested. Grassland is the second most

prevalent land cover accounting for about 36.6% of the total watershed area. The categories of cropland and urban account for approximately 0.1% and 0.6% of the total watershed area respectively, while the land cover category of water accounts for approximately 0.1% of the watershed area.

The Big Piney Watershed is situated in one of the wetter parts of Missouri which receives from 32 inches of precipitation in the Northwest to 48 inches in the Southeast of the state. The United States Geological Survey had, as of 2002, two active surface discharge gage stations within the Big Piney Watershed. The annual daily mean discharge of the Big Piney River near Big Piney, Missouri is 542 cubic feet per second.

Approximately 264 stream miles and 10 impoundment acres within the Big Piney Watershed are classified and have designated beneficial uses as presented in Tables G and H of the Rules of the Department of Natural Resources Division 20-Clean Water Commission Chapter 7-Water Quality. Currently, a 0.2 mile segment of Brushy Creek is included in the 1998 303(d) listing of impaired waters. In addition, all waters within the Big Piney Watershed are currently (2004) included in a statewide fish consumption advisory for largemouth bass. Women who are pregnant, who may become pregnant, nursing mothers and children twelve (12) years of age and younger should not eat any largemouth bass over twelve (12) inches in length from anywhere in Missouri due to elevated levels of mercury. Periodically elevated phosphorous levels and fecal coliform counts have been noted at a few water quality sample sites within the watershed and two springs within the watershed have been determined to suffer from probable septic contamination. In addition, detections of pesticides and/or elevated levels of other constituents have been noted from some ground water and surface water quality sites. The Big Piney Watershed is unique to many other watersheds in Missouri in that a large military installation, at least in part, is located within its boundaries. The presence of Fort Leonard Wood presents unique water quality concerns which are not applicable to many other watersheds. Sixty-Eight sites have been identified in association with Fort Leonard Wood as “having the possibility to cause contamination”. Remediation or interim remediation activities have been conducted at 11 sites. A total of 56 sites are listed as “response completed” sites, while 12 sites “have been identified for further investigation and/or remediation” or are otherwise considered active sites (USAEC 2003). Currently, all remediation activities are on track to be completed by 2009, with the Fort Leonard Wood’s Installation and Restoration Program scheduled to be completed in 2017. Other items which have the potential to cause water quality problems include large numbers of livestock in riparian zones for extended periods of time, private septic system failure, increased nutrients from municipal sewage treatment facilities, improper sand and gravel removal, and poor land use practices such as land clearing without the use of appropriate soil and water conservation practices.

Within the Big Piney Watershed there are currently 6 dams which have records within the Dam and Reservoir Safety Program Database. All are reinforced earth structures with heights ranging from 12 to 27 feet. Impoundment areas range from 4 to 45 acres. Estimates based on analysis of National Wetlands Inventory data indicate that only about 3 miles of channelized stream exist within the Big Piney Watershed. All channelization within the watershed appears to be relatively small and localized. Riparian corridor land cover within the watershed consists of more forest/wetland (68.3%) than grassland/cropland (31.1%). Percentages for the remaining

categories of urban and water are 0.2% and 0.4% respectively.

The Big Piney Watershed exhibits a diverse biotic community. Since 1930, an assemblage of 73 fish species, 32 mussel species and subspecies, 6 species of snails, 3 crayfish species, and 191 taxa of benthic macro-invertebrates (not including mussels and crayfish) have been identified throughout the watershed. A total of 41 terrestrial and aquatic species and subspecies of conservation concern are known to occur in the watershed. This list includes 4 fish species, 5 species of mussels, 2 species of amphibians, 1 species of crayfish, and 2 species of insects. The most common game fish species within the watershed include smallmouth bass, rock bass, and largemouth bass. In addition, two significant rainbow trout fisheries occur within the watershed. Sucker species provide an alternative consumptive recreational opportunity within the watershed. Invasive exotic aquatic species within the watershed include the Asian clam and the common carp.

The management goals, objectives, and strategies for the Big Piney Watershed were developed using information collected from the Big Piney Watershed Inventory and Assessment (WIA) effort and direction provided by the Ozark Regional Management Guidelines (1998), Missouri Department of Conservation (MDC) Strategic Plan, and the Fisheries Division Direction. Objectives and strategies were written for in-stream and riparian habitat, water quality, aquatic biota, recreational use, and hydrography. All goals are of equal importance. These goals include (1) improve riparian and aquatic habitats in the Big Piney Watershed, (2) improve surface and subsurface water quality in the Big Piney Watershed, (3) maintain the abundance, diversity, and distribution of aquatic biota at or above current levels while improving the quality of the sport fishery in the Big Piney Watershed, (4) increase public awareness and promote wise use of aquatic resources in the Big Piney Watershed. The attainment of these goals will require cooperation with private landowners, other divisions within the Missouri Department of Conservation, as well as other state and federal agencies.

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