GASCONADE RIVER

WATERSHED

INVENTORY AND ASSESSMENT

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Executive Summary

The Gasconade River watershed is located within the Ozark Plateau of the Interior Ozark Highlands. The river meanders north to northeast through Webster, Texas, Laclede, Pulaski, Dent, Maries, Osage, Phelps, and Gasconade counties to join the Missouri River. The Gasconade River is 271 miles long from mouth to headwaters with 263 miles having permanent flow. The Upper and Lower Gasconade River watersheds drain 2,806 square miles. The Upper Gasconade River watershed has an average gradient of 27.6 feet/mile, and the Lower Gasconade River watershed has an average of 3.9 feet/mile. A number of springs within the middle Gasconade River portions are due to the karst geology of the Roubidoux and Gasconade Dolomite Formation and losing stream segments. The karst topography causes losing portions in the Osage Fork, Roubidoux, North Cobb, Little Piney, Spring, and Mill creeks, and Gasconade River. The entire Gasconade River watershed is reported to have 76 springs and the largest concentration of big springs in the state**.**

As a whole, the Gasconade River watershed is rural with low population density and high farmland density. The most populated areas are Pulaski and Phelps counties, which are experiencing land development from growth surrounding Fort Leonard Wood and the City of Rolla. Lower watershed areas of Maries, Osage, and Gasconade counties have low population density. The Upper and Lower Gasconade River watersheds have 49% and 33%, respectively, grassland and cropland as land use. A general trend in the rural Gasconade River watershed toward increased cattle numbers per pastured acre has continued to the present. Forest comprises approximately 46% of the land cover within the Upper

Gasconade River watershed and 66% within the Lower Gasconade River watershed. Forests are in good health and have sustainable forest production. Forest land is largely under private ownership with federally-owned forest having the second largest holdings, followed by state-owned lands having a smaller percentage. Public land is 12% or 221,040 acres within the entire watershed. To provide water-based recreational opportunities, 23 public stream accesses have been developed in the watershed.

Gasconade River watershed annual precipitation ranges from 40.35 to 42.67 inches with a annual mean of 41.66 inches. This precipitation and the local geology provides good base flow conditions and lower variability in stream flow throughout major portions of the watershed. Average runoff had greater extremes from the late 1970s to the present than during the 1960s to the late 1970s.

The Gasconade River watershed's designated stream uses, assigned by the Missouri Department of Natural Resources (MDNR) are warmwater aquatic life protection and fishing, and livestock and wildlife watering. Threats to beneficial uses in the Gasconade River watershed are point and non-point sources of pollutants. The number of point pollution sources and flow from point pollution sources is low. In fact, improvements have been made to point source discharges through monitoring by the MDNR and sewage treatment upgrades. Also, the Gasconade River has recovered well from the December 1988 oil spill that released hundreds of thousands of gallons of crude oil into the main stem Gasconade River from a broken pipeline near Vienna. On the contrary, non-point source pollution remains a difficult challenge. Numerous MDNR Soil and Water Program Special Area Land Treatment projects in the Upper Gasconade River HU, and portions of the Upper Osage Fork HU are addressing nutrient problems that have cattle manure as their sources. Sand and gravel mining in sensitive areas can and has effected fisheries, especially sensitive cool- and cold-water fisheries. Other potential non-point pollution sources are two landfills in Wright and Phelps counties. Runoff from farms, mining operations, construction sites, forest operations, residential septics, and impervious surface in urbanized areas create a complex resource management challenge.

The Upper Gasconade River watershed was poorly forested along major segments of its tributaries and main stem compared to the Lower Gasconade River watershed. Thirty-eight percent of the major stream segments within the Upper Gasconade River watershed and 46% of the major segments of the Lower Gasconade River watershed had forested corridors. Results of the corridor quality ratio used to assess stream segments indicated that the Lower Gasconade River watershed had more stream segments rated as good (81%) than the Upper Gasconade River watershed (64%). Based on the land use/ land cover GIS analysis, priority management should be given to those hydrologic units that were rated relatively low on the objective rating scale. The Lower Gasconade River HU was rated as poor due to the lack of forested stream corridor. In addition, the Lower Roubidoux Creek HU, should be given priority management attention because of its sensitive springs, growing human population, and urbanization.

Of the total wetland acreage within the Upper Gasconade River watershed, 0.9% met the nursery wetland criteria and within the Lower Gasconade River watershed another 0.6% met the criteria. The Upper Gasconade River watershed had more temporary and temporary-semipermanent pools than the Lower Gasconade River watershed. High stream density in the Upper Gasconade River watershed is attributed to the difference. Large expanses of pool/riffle complex habitat can be found in the Upper Gasconade River, especially in the Middle Gasconade River HU. Gravel bars are more prominent in the Middle Gasconade River HU due to slower water velocities, lower gradient, and stream disturbances.

The Gasconade River watershed has a diverse assemblage of 103 fish species collected from 1900 to

1999. These species are distributed among 49 genera and 21 families of fish ranging form the ancient Petromyzontidae (lampreys) to the more modern Percidae (perches) and Sciaenidae (drums). Despite the high number of fish species in the Gasconade River watershed, 9 species are listed on the Missouri Species of Conservation Concern Checklist of June 2000 as critically imperiled, imperiled, or rare. The crystal darter *(Crystallaria asprella)* is classified as a state endangered species, and the bluestripe darter (*Percina cymatotaenia*) is state imperiled species.

A total of 46 mussel species were collected from Little Piney Creek, Roubidoux Creek, Osage Fork, and the main stem Gasconade River. The dominant genera were *Lampsilis* (6 species), *Quadrula* (3 species), and *Fuconaia* (2 species). These species were distributed among 27 different genera. The pocketbook mussel (*Lampsilis cardium*) was the most widely distributed mussel in the watershed. Species that are much less abundant include the state-listed endangered mussel species, the elephant ear (*Elliptio crassidens*), ebonyshell (*Fusconaia ebena*), and the pink mucket (*Lampsilis abrupta*). The pink mucket is also classified as federally endangered.

Seven species of crayfish have been collected in the Gasconade River watershed and three genera encompass the seven species. *Orconectes* was the dominant genus and comprised over 99% of the crayfish composition. Devil crayfish *(Cambarus diogenes)* were collected in Roubidoux Creek, and digger crayfish *(Fallicambarus fodiens)* were collected in the lower Gasconade River. The rare Salem cave crayfish (*Cambarus hubrichti*) is located in some caves of the watershed.

Anglers have numerous sport fishing opportunities as the Gasconade River changes character from an Ozark headwater stream system to a large river system. According to the Missouri Department of Health, all game fish are safe to eat in the Gasconade River watershed. Studies on the Osage Fork of the Gasconade River revealed that numbers of black basses and rock bass of regulation size were in good supply. An Osage Fork Smallmouth Bass Special Management Area (SMBSMA) was created in 2000. An Osage Fork Special Management Area has been established for rock bass beginning in March 2001. In 2001 on Little Piney Creek, a Wild Trout Management Area (WTMA) was formed and a Trout Management Area (TMA) was relocated. The Lane Spring TMA was discontinued due to the creation of the WTMA. Portions of Mill Creek and Roubidoux Creek also support trout fisheries.

The major goals for the basin are improved water quality, better riparian and aquatic habitat conditions, the maintenance of diverse and abundant populations of native aquatic organisms and sport fish, and increased public appreciation for the stream resources. Periodic fish population samples will be collected and appropriate habitat surveys will be conducted. Fishing regulations will be adjusted if needed to maintain quality fishing. Cooperative efforts with other resource agencies on water quality, habitat, and watershed management issues will be critical. Enforcement of existing water quality and other stream-related regulations, and necessary revisions and additions to these regulations, will help reduce violations and lead to further water quality improvements. Working with related agencies and cooperating with citizen groups and landowners to promote public awareness and landowner incentive programs will result in improved watershed conditions and better stream quality, diverse and abundant population of native aquatic organisms, and wonderful angling opportunities.

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