By Douglas Helmke, P.G., Water Rights/Source Water Specialist

Quivira National Wildlife Refuge and Water Rights Concerns

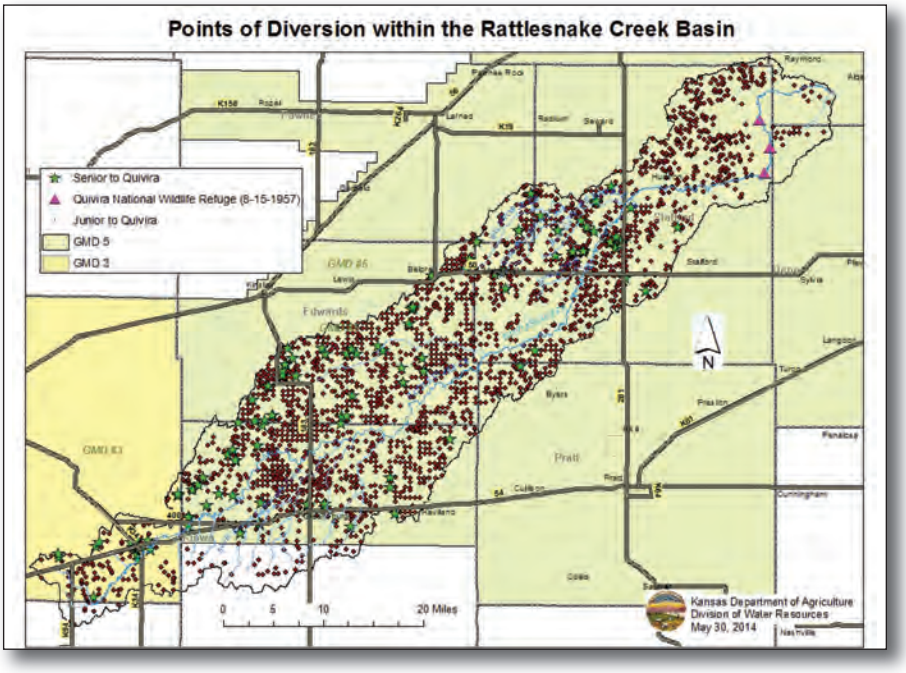
Quivira National Wildlife Refuge is a favorite resting stop for migrating Whooping Cranes in the spring and fall. This pair of cranes were photographed in 2010. (Photo by D. Severson, courtesy of the U.S. Fish & Wildlife Service.)

On December 10, 2015, an informational meeting hosted by the Kansas Department of Agriculture, and their Division of Water Resources, was held in Saint John, Kansas. The Chief Engineer of the Division of Water Resources was there to explain to the area's water users that he and his staff had received a complaint of impairment and that research found that the impairment complaint was valid. Chief Engineer David W. Barfield explained what research was done and the tools used to evaluate the data. He announced that the public had 60 days to review the initial impairment complaint report and to submit comments regarding the process and findings that have been made up to the present. Secretary of Agriculture Dr. Jackie McClaskey encouraged those who would make comments to submit those comments as soon as possible to make the resolution of this conflict happen sooner than later. While any conflict with the potential to have water usage restrictions imposed can be unsettling, the fact that the impaired water right is for recreational purposes, and those water rights believed to be impairing it are for irrigation use and possibly municipal use, the apprehension of the junior water rights owners is particularly high.

The Rattlesnake Creek Drainage Basin is primarily located in the Kansas counties of Stafford, Pawnee, Edwards, Kiowa and Ford, with very small portions in Clark, Barton, Rice and Reno counties. Covering 1,276 square miles, it is a narrow watershed – only 22 miles wide at its greatest distance. It is a long watershed, however. It stretches approximately 92 miles from its headwaters in Ford County, near Kingsdown, to its joining to the Arkansas River in Rice County, not far from Raymond. Prior to human habitation, the area was a transition zone from tallgrass to shortgrass prairie. "The History of the State of

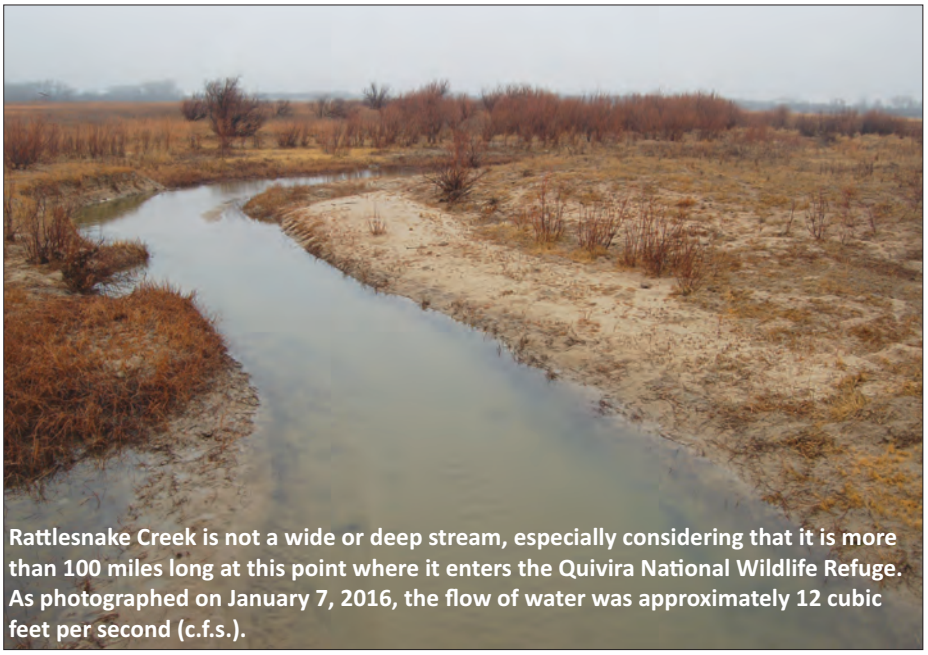
Kansas", a book written by A. T. Andreas and published in 1883 describes the Stafford County area as "one vast level plain, except at intervals there are long lines of numerous sand hills." Grass covered the sand hills and the plains. Andreas also said "the county is utterly destitute of timber." Water could be had in the level places throughout the county at a usual depth of ten to twelve feet. As the railroads were built west from Wichita and Hutchinson, many settlements were established to serve the homesteaders who were attracted to these level plains. St. John and Belpre were platted in 1879. Macksville, Greensburg and Bucklin followed in 1885, with Mullinville in 1886.

The first water rights established in the Rattlesnake Creek Drainage Basin were primarily municipal use water rights for the communities. There were a few irrigation water rights established in the 1950's and 60's, but with Frank Zybach's center pivot irrigation design coming off patent in 1969, new companies with new designs and better reliability made these irrigation systems a must-have tool for Kansas farmers who remembered the droughts of the 30's and 50's. If you could access a reliable and sufficient source of water under a quarter-section of land, you had to have a center pivot.



This map shows the boundaries of the Rattlesnake Creek Drainage Basin. Quivira National Wildlife Refuge's diversion points are shown by pink triangles. Water rights senior to Water Right, File No. 7,571 are shown as green stars. The red diamonds are the water rights that are junior to File No. 7,571.

If you could access a reliable and sufficient source of water under a quarter-section of land, you had to have a center pivot.



Rattlesnake Creek is not a wide or deep stream, especially considering that it is more than 100 miles long at this point where it enters the Quivira National Wildlife Refuge. As photographed on January 7, 2016, the flow of water was approximately 12 cubic feet per second (c.f.s.).

Fortunately, the Rattlesnake Creek Drainage Basin gets enough recharge from precipitation during most non-growing seasons that groundwater levels remain relatively stable. The Kansas Geological Survey reports that many areas in the drainage basin had recent water levels (average for the period of 2013 - 2015) at elevations higher than the water levels at the pre-development (the 1940's and earlier) period. In this regard, it appears that the area does not experience a condition where there has been an over-appropriation of water rights. Unfortunately for groundwater users, Water Right, File No. 7,571 is a surface water, water right. Development of this recreational water right was made by the use of water which flowed down Rattlesnake Creek into Little Salt Marsh. While some of the streamflow can probably be attributed to storm events, much of this surface water was water that bled out of the full or nearly-full aquifer to the channel of Rattlesnake Creek. The Chief Engineer's report states that the many irrigation wells upstream of the Quivira National Wildlife Refuge are lowering

This is a view of the Little Salt Marsh, looking north from the site of the refuge's observation tower, which is closed pending repairs.

the water table to the degree that there is no longer the necessary discharge of groundwater into Rattlesnake Creek channel to satisfy the water right for the wildlife refuge

The majority of the Rattlesnake Creek Drainage Basin is underlain by interbedded deposits of silt, sand and gravel sized particles, which vary in proportion and elevation in lateral directions. This deposit, called the Meade Formation by the Kansas Geological Survey, has been found to be over 200 feet thick in some locations. As mentioned earlier, the coarse material in the soils and subsoils is a positive factor in the recharge rate of the area. In the southwest and central portion of the watershed, these deposits lie on non-permeable bedrock deposits. In the northeast part of the watershed, the bedrock has some permeability, and provides groundwater with high concentrations of chloride. Natural brine water flows upward from the depths, which mixes with the fresher, shallower groundwater until it reaches the surface, primarily at Big Salt Marsh. This saline water likely had a role in controlling and preventing the growth of typical wetland vegetation, allowing sediment to be exposed during dry periods, and creating the unique salt marshes that are now in the refuge, many miles from the oceans.

The Quivira National Wildlife Refuge was started in 1957 with the purchase of land from a number of private duck hunting clubs and farmers by the U.S. Fish & Wildlife Service. An application to develop a water right was filed with the Division of Water Resources on August 15, 1957. The application was assigned File No. 7,571, and was approved with the issuance of a permit to develop a water right on May 9, 1963. The maximum extent of the water right to be developed by actual use was for a quantity not in excess of 22,200 acre-feet of surface water at a rate of

K.A.R. 5-1-1. Definitions. As used in these regulations and the Kansas water appropriation act, and by the division of water resources in the administration of the Kansas water appropriation act, unless the context clearly requires otherwise, the following words and phrases shall have the meanings specified in this regulation.

. . . "Recreational use" means a use of water in accordance with a water right that provides entertainment, enjoyment, relaxation, and fish and wildlife benefits.

diversion not to exceed 300 cubic feet per second. The application showed that a number of canals would be built to transfer water to various locations throughout the refuge property after water was captured in Little Salt Marsh. On April 9, 1996, the appropriation was certified for a quantity of 14,632 acre-feet at a rate of diversion not in excess of 300 cubic feet per second, after many years of negotiation over the quantity of water actually diverted.

Kansas water right law is based on the doctrine of prior appropriation, which was developed in the gold mining areas of California in the 1850's. The allocation of water, in times of shortage, is based on the principal of "first in time, first in right." No other consideration is to be made in regards to economics, etc., when there is not enough water to satisfy all of the water rights, if the philosophy is strictly followed. A water right's priority date is set by the receipt of that water right application's acceptance in the office of the Chief Engineer. Unfortunately, in this specific instance, there appears to be plenty of groundwater in the aquifer for every irrigation water right, but a very senior (meaning first in time relative to those filed later) surface water right is often impaired by those irrigators with junior (meaning not first in time) water rights. When all of the water rights of the Rattlesnake Creek Drainage Basin are compared in regards to priority, the water right for Quivira National Wildlife Refuge is senior to approximately 95% of the total. All but one public water supply system located in the Rattlesnake Creek Drainage Basin have water rights that are senior to the wildlife refuge, and every one of them also have water rights that are junior to the refuge's water right.

Kansas water right law is based on the doctrine of prior appropriation, which was developed in the gold mining areas of California in the 1850's.

The role of Chief Engineer of the Division of Water Resources is varied and complex. One such area of responsibility is water appropriation. The Kansas Water Appropriation Act requires the Chief Engineer to determine the development of vested water rights (this task is largely completed), to withhold appropriations to establish and maintain established Minimum Desirable Streamflow values, to approve new appropriations of water when the proposed appropriation neither impairs a use under an existing water right nor prejudicially and unreasonably affects the public interest, to approve reasonable changes to existing water rights, to issue water right certificates and to adopt and enforce regulations pertaining to water rights. Another duty is the resolution of impairments. K.S.A. 82a-706 states that the Chief Engineer shall enforce and administer the laws of this state pertaining to the beneficial use of water and shall control, conserve, regulate, allot and

aid in the distribution of the water resources of the state for the benefits and beneficial uses of all of its inhabitants in accordance with the rights of priority of appropriation. In other words, when a water right owner has a senior water right that cannot be exercised because the use of a junior water right is taking the water that would be available in the absence of the junior water right, the Chief Engineer is to control the use of the junior water right or rights. This is further stated in K.S.A. 82a-706b(a), in part, that it shall be unlawful for any person to prevent, by diversion or otherwise, any waters of this state from moving to a person having a prior right to use the same.

On April 8, 2013, the United States Fish and Wildlife Service, filed a formal impairment complaint with the Chief Engineer. Leading up to this step, the Fish and Wildlife Service, Big Bend Groundwater Management District No. 5 (GMD5) and Water Protection Association of Central Kansas, also known as WaterPACK (which represents irrigators in the area), worked for many years to promote voluntary reductions of water use. This group was identified as the Rattlesnake Partnership. Significant changes in Rattlesnake Creek streamflow was not realized through these efforts, however, prompting the complaint filing.

Because of the complexity of the aquifer, the stream and the relationship of both to each other, and with diversions of the groundwater from multiple locations above the aquifer, a significant amount of time and resources went into the investigation of the complaint. On December 2, 2015 (32 months after the filing of the written complaint) the initial investigation report was posted on the Division of Water Resources Web site, with an announcement of an opportunity to discuss the findings with the Chief Engineer on December 10, 2015. The Chief Engineer has concluded that 3,000 to 5,000 acre-feet of water need to be made available to the wildlife refuge on a regular, annual basis. It was also announced that time would be given to review the report and accept comments for approximately 60 days before the report would be made final. At least one newspaper published an article immediately following the meeting stating that the initial report was already being rejected by the Rattlesnake Partnership members GMD5 and WaterPACK, but did not specify on what grounds those entities believed the report to be incorrect or incomplete. A final report will be issued at approximately the same time that this article is published unless there are more delays.

Chief Engineer David Barfield and his staff came to the December 10 meeting with more news than the report contained that impairment was occurring. As part of the study showing how the use of water by junior water rights was impairing Water Right, File No. 7,571, more than ten scenarios were evaluated with the groundwater model to predict how the stream and aquifer would react in magnitude and timing to the various remedies that could be employed. These remedies included total shut-off of all junior water rights above the diversion points of Water Right, File No. 7,571, to significant reductions of water rights located within various distances of the stream, such as 1- and 2-mile corridors. It was determined that real-time administration was not a useful tool, as it will likely take as long as three years for streamflow values to show the response to pumping curtailments. Because of these findings, the Chief Engineer has determined that the remedy to the impairment will include significant reductions of annual pumping limits, augmentation, or both.

Augmentation is a relatively new term in the Kansas water rights lexicon. In an attempt to resolve an issue in the Republican River Compact dispute, the State of Colorado proposed that "Compact Compliance Wells" be drilled in the Ogallala Aquifer and the water pumped from these wells put into a "Compact Compliance Pipeline" or CCP. The CCP delivered water to the North Fork Republican River at the Colorado - Nebraska state line, to be considered as restoration of streamflow under the requirements of the Compact and subsequent lawsuits. Water rights for irrigation were obtained by the state and "retired" with the consumptive use of those previous rights transferred to the CCP Wells, resulting in no net increase of water consumption in the watershed. Colorado, Nebraska and Kansas agreed to this in October 2014, with the understanding that a similar project would be considered on the South Fork of the Republican River at the Colorado - Kansas state line.

What isn't clear is how such an augmentation project would work in the Rattlesnake Creek Drainage Basin. Neither is it clear how such a project would be operated, how it would be funded or where it would be located. Such a project will likely require the cooperation of water users throughout the watershed, and at the present time, cooperation may be a difficult thing to accomplish. Water rights whose operation doesn't currently have a negative affect on the streamflow would be best, but those water rights would likely have to be purchased from a willing seller. Such water rights are likely located many miles from the stream and would require a long pipeline. Kansas water law was modified in 2015 to allow augmentation, stating in part in 82a-706b (2) "within the Rattlesnake Creek Subbasin located in Hydrologic Unit Code (HUC) 11030009, allow augmentation for the replacement in time, location and quantity of the unlawful diversion, if such replacement is available and offered voluntarily".

At this time, it is impossible to know what consequence there will be on the public water supply systems in the Rattlesnake Creek Drainage Basin. While on the surface it appears to be a whooping cranes versus irrigators conflict, it is really a senior water right versus junior water rights skirmish.

Such a project will likely require the cooperation of water users throughout the watershed, and at the present time, cooperation may be a difficult thing to accomplish.

Kansas Rural Water Association has invited the elected officials and the water system personnel from the six communities in the Rattlesnake Creek Drainage Basin to a meeting with DWR staff to learn more about the cause of the impairment. The officials and operators will learn how much exposure their water rights have to possible administration. The systems will learn about the possible remedies and the chances of pumping restrictions being placed on their junior municipal water rights. Other information that may be provided could be the probable requirements of an augmentation facility. The Kansas Department of Agriculture wants to have remedies identified, and possibly implemented, in 2017, which doesn't leave the water systems much time to respond if a significant reduction to the water rights is enacted.

Douglas S. Helmke has been the Water Rights Tech at KRWA since June 2000, and also a Wellhead / Sourcewater Protection Tech since 2003. He holds professional geologist certification in Kansas and Missouri. Doug received a bachelor degree in geology from Kansas State University.