Draft Report

A Phase I Cultural Resources Survey of the Nebraska Segment of the Proposed Keystone Pipeline Project Corridor, Cedar, Wayne, Stanton, Colfax, Platte, Butler, Seward, Saline, Jefferson and Gage Counties, Nebraska

Prepared for
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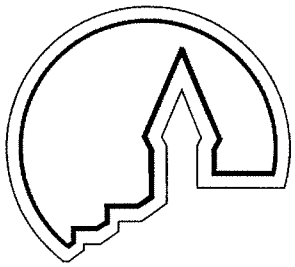

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Abstract

This report describes the results of a Phase I cultural resources survey of the Nebraska segment of the proposed Keystone pipeline route. The proposed route passes through 10 counties in its 214-mile transect across eastern Nebraska. The primary objectives of the present investigation were to locate and record all cultural resources within the project corridor and to make a preliminary assessment of their cultural significance using National Register of Historic Places (NRHP) criteria. The methods employed were multi-faceted. First, literature and records reviews were conducted to identify previously recorded cultural resources within the vicinity of the project corridor. Secondly, a systematic survey of the corridor was conducted to identify cultural resources. Finally, a geomorphological investigation was conducted to identify high potential areas for buried cultural deposits. The data derived from the cultural resources identified in the project corridor were used to evaluate their potential NRHP significance based on a standard set of criteria (36CFR60.6, *Federal Register* 1976).

To date, the survey has recorded 23 new sites and re-visited two previously recorded sites within the project corridor(s). Three prehistoric sites (25CD21, 25SW53, and 25SW54) appear to meet the NRHP criteria of significance and are evaluated as potentially eligible for listing to the NRHP. The segments of the original proposed project corridor that contained these sites were subsequently rerouted to avoid the sites; consequently, they are now located outside of the current project corridor and will not be impacted by construction activities. One historic site (25SA79) appears to meet the NRHP criteria of significance and is evaluated as potentially eligible for inclusion in the NRHP. This site also lies outside of the current project corridor and will not be impacted by pipeline construction. One previously recorded historic site, (25CX7) requires additional archival research before it can be evaluated for NRHP significance. This site lies within the current project corridor and should be avoided until the evaluation is complete.

Apart from the potentially eligible sites which are outside of the currrent proposed project corridor, site 25CX7, and the areas identified for additional geomorphological/geoarchaeological investigations, the results of the present survey indicate the proposed undertaking will not impact significant cultural resources within the surveyed portion of the Keystone pipeline corridor. It is recommended that the proposed construction activities be allowed to proceed as planned with the exceptions discussed above.

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Introduction

This report describes the results of a Phase I cultural resources survey of the Nebraska segment of the proposed Keystone pipeline route. The proposed route is 214 miles in length and crosses ten counties in eastern Nebraska (Figure 1-1). To date, approximately 207 miles of the 214 miles have been surveyed. This investigation was conducted by American Resources Group, Ltd. (ARG), Carbondale, Illinois, under the terms of a contract with ENSR International, Fort Collins, Colorado.

Project Description

The Nebraska Keystone pipeline corridor survey that is reported herein involved a 214-mile segment through Cedar, Wayne, Stanton, Colfax, Platte, Butler, Seward, Saline, Jefferson, and Gage counties (Figure 1-1). The survey corridor measures 300 feet (91.44 m) in width and is centered on the proposed pipeline centerline. Throughout the rest of the report this corridor is referred to as the "project corridor".

The project corridor begins at the pipeline route milepost (MP) 437 at the Nebraska-South Dakota border and ends in Jefferson County at MP 638.5 where it turns southeast. It then parallels the REX pipeline corridor through Gage County to the Kansas border (Figure 1-1). No survey was conducted in the Gage County portion since it parallels the previously surveyed Rocky Mountain Express (REX) pipeline corridor (Schwegman et al. 2006) in that area.

The original proposed pipeline routes and several re- routes were surveyed during the course of the cultural investigations (see Appendix J). Re-routes were necessary in order to avoid archaeological sites evaluated as potentially eligible for listing on the National Register of Historic Places (NRHP) and to revise the alignment for engineering purposes. Consequently, the total miles surveyed (N=238.8) exceeds the linear distance between MP 437 and MP 638.5 and exceeds the total length of the proposed pipeline route (N=214 miles). A total of 23 new sites has been recorded to date within the project corridor. Two previously recorded sites were re-visited. All sites recorded within the original and current proposed project corridors are reported here and the locations depicted in Chapter 5 and Appendix J.

As noted above, the portion of the proposed Keystone project corridor surveyed to date measures 238.8 miles in length and encompasses approximately 8,683.6 acres (3,514.1

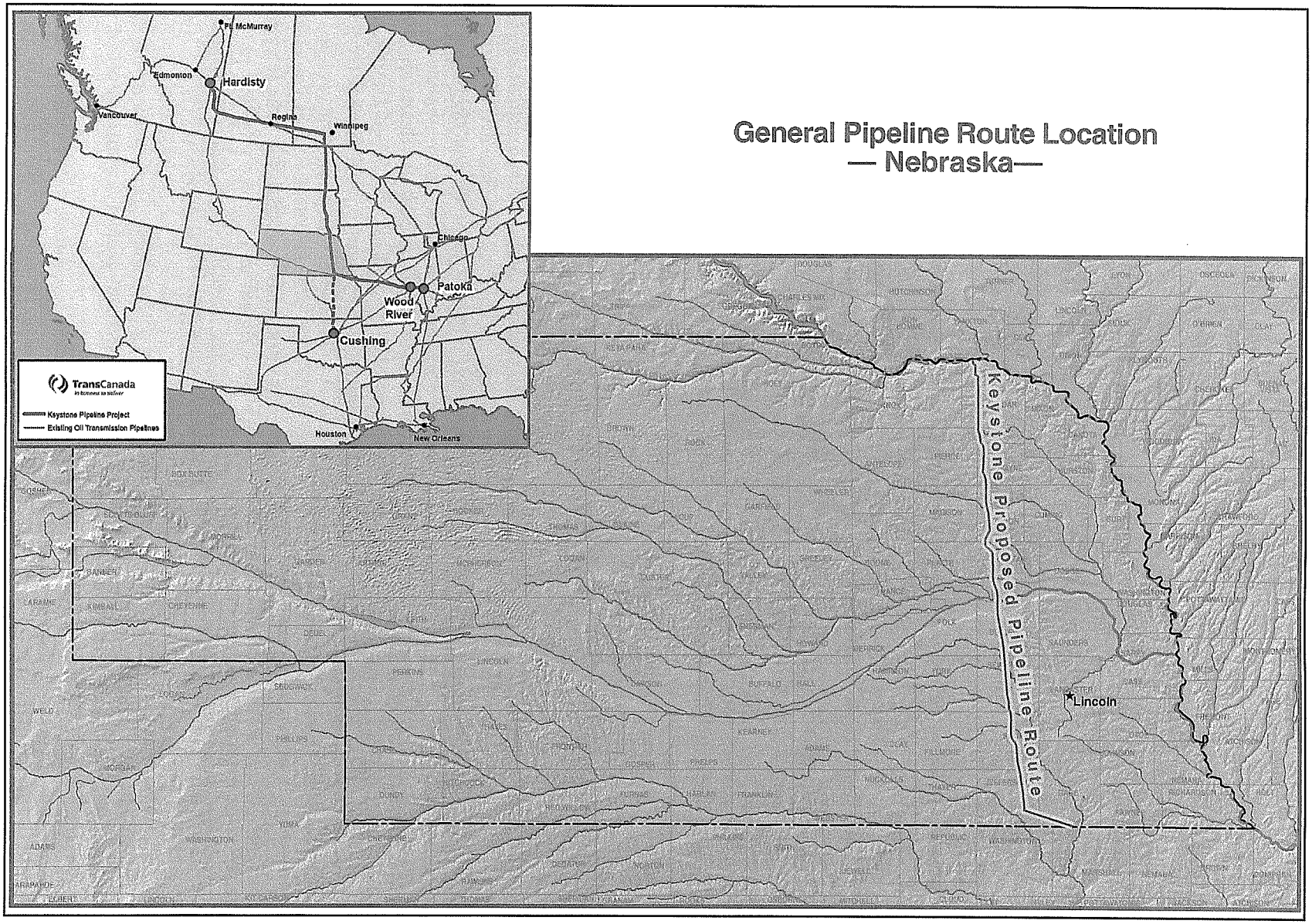

Figure 1-1. General location of the proposed Keystone pipeline route in Nebraska.

ha.) of land. This leaves approximately 6.7 miles to be surveyed within the current project corridor once land owner permission has been obtained. The remaining tracts to be surveyed lie within mileposts 438.1–438.25; 478.3–478.7; 533.6–534.1; 570.2–570.5; 586.7–587.5; 601.05–601.7; 602.65–603.1; 603.7–606.0; 606.3–607.1; 616.1–616.6.

The Keystone pipeline will ultimately be capable of transporting 435,000 barrels of crude oil per day from Alberta, Canada to markets in the United States. The total length of the proposed pipeline is 1,845 miles (2,969 km) before it terminates near Patoka, Illinois. Local communities along the route will also be able to access the oil supplies carried by the pipeline. The project sponsor is TransCanada of Calgary, Alberta. The U.S. Department of State (DOS) is the lead federal agency and will coordinate the participation of the other state and federal agencies that must also review parts of the project.

Construction activities related to the excavation and installation of the crude oil pipeline to a minimum depth of 4 feet constitute potential adverse impacts to archaeological resources. The Nebraska segment of the Keystone project corridor is 300 feet (91.44 m) wide in most places, although the width of the corridor expands slightly where re-routes diverge from the original proposed pipeline corridor (see Appendix J).

The primary objectives of the Phase I survey were to identify all significant cultural resources located within the project corridor and to provide a preliminary assessment of their eligibility for listing to the NRHP. These objectives were achieved through a records search and literature review conducted to identify previously recorded cultural resources within the project corridor and a complete-coverage field survey of the project corridor conducted to identify unrecorded cultural resources. The archaeological survey of the project corridor was supplemented with a Phase I geomorphological/geoarchaeological investigation conducted to determine whether buried culture-bearing deposits are present in the depositional environments (stream valleys) present within portions of the project corridor. The data derived from the subsequent analysis of the investigated resources and their respective assemblages were used to evaluate those resources against the NRHP criteria of significance (36CFR60.6, *Federal Register* 1976).

Authority for identifying and evaluating archaeological resources before construction begins is provided by the National Historic Preservation Act of 1966 (amended 1980) and the Archaeological Conservation Act of 1974. All work conformed to professional standards and guidelines in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register 1983) and the Nebraska State Historic Preservation Office, National Historic Preservation Act Archaeological Properties Section 106 Guidelines (Nebraska State Historical Society 2001).

Personnel

Two Class 1 site files searches and a GLO map search were conducted and reported in Burnett and Slessman (2006). The files searches were conducted by Rene Botts of the Nebraska SHPO office between January 6 and 11, and on March 2, 2006. The GLO search was performed by Paul Burnett of SWCA Environmental Consultants, Broomfield, Colorado.

Fieldwork was conducted from May 8 to June 2, 2006 and from October 23 to November 15, 2006. Steve Titus served as the principal investigator, and H. Blaine Ensor and Steve Titus served as the supervising archaeologists. The field crew consisted, at various times, of Loy Addington, Bob Bell, Mike Brawley, Ruth Holland, Guy Knight, Nathan Paskert, and Bob Sadler. Jeff Anderson of Anderson Environmental Services preformed the Phase I geomorphological investigation.

James Burrow conducted the prehistoric artifact analysis while Cally Lence and Kevin Lomas conducted the historic artifact analysis. Jarvis Schultz and Darren Fink prepared the report graphics. Gabrielle Aberle edited and formatted the report. H. Blaine Ensor wrote Chapters 1 and 6. Chapter 2 was written by John Schwegman and Gabrielle Aberle while Chapter 3 was written by John Schwegman, Gabrielle Aberle, and Cally Lence. H. Blaine Ensor, Cally Lence, Jeff Anderson, Monica Shah-Lomas, and Gabrielle Aberle wrote Chapter 4 and H. Blaine Ensor, Cally Lence, and Kevin Lomas wrote Chapter 5.

Report Format

An overview of the regional and local environment is presented in Chapter 2. Chapter 3 provides a cultural overview of the region and includes a brief discussion of the previous investigations conducted within the project corridor. The research design of the project, including the field and laboratory methods employed during the investigation, is presented in Chapter 4 and the cultural resources recorded within the project corridor are inventoried in Chapter 5. Chapter 6 summarizes the results of the Phase I survey and contains preliminary NRHP evaluations and management recommendations for each of the cultural resources identified within the project area during the present investigation.

Appendix A contains artifact inventory tables not incorporated into the text of the report and Appendix B contains photographs of selected artifacts recovered during the present survey. Photographs of surface features present at historic sites recorded in the project area are in Appendix C. Appendix D contains site forms for previously recorded sites located within the project corridor while Appendix E contains site forms for each site identified during the present survey. Appendix F presents the preliminary results of the geomorphological investigations and the unanticipated discoveries plan is presented in Appendix G. For the final report, Appendix H will contain correspondence between ARG and the Nebraska SHPO. Appendix I contains correspondence associated with the tribal notification process. Appendix J contains USGS topographic maps showing the various project corridor alignment and archaeological sites investigated during the Phase I survey.

2

Environmental Overview

The Nebraska Segment of the proposed Keystone pipeline route has its northern end in Cedar County at the South Dakota border and extends south, exiting the state in Gage County at the border with Kansas. This route covers 214 miles and crosses ten counties, as well as a number of distinct, geologically defined landscapes and naturally defined vegetative zones. The following sections characterize the physiography, geology, and soils found along the proposed pipeline route. A discussion of the native floral and faunal resources is also presented.

Physiography

Two major physiographic regions are represented in Nebraska, the Central Lowland and the Great Plains. The project corridor lies entirely within the Central Lowland which covers the eastern fifth of the state and parallels the Missouri River (Microsoft Encarta Encyclopedia 2006). This area consists of loess-covered hills of glacial deposits highly dissected by rivers and their valleys.

Geology

The project corridor crosses bedrock of Tertiary and Cretaceous ages (Figure 2-1) distributed in north/south belts in the eastern part of the state. The strata deepens toward the west which results in older formations outcropping to the east and younger formations appearing in the west.

Tertiary bedrock occurs in the northern half of the project corridor in Cedar, Wayne and Stanton counties and is represented by the Ogallala Formation. This formation consists of sequences of coarse-grained sand and gravel in the lower levels grading upward into fine clay, silt, and sand. The basal gravel occurs in layers and ranges in size from boulders to pea size with pebbles and cobbles of quartz, quartzite, and chert being common (Burchett 1986).

Bedrock associated with the Cretaceous period is represented by the Pierre, Niobrara, Carlile, Greenhorn-Graneros, and Dakota formations (Burchett 1986), with all but the latter formation dating to the Upper Cretaceous period. The Pierre Formation consists of a gray to black marine shale which contains minor strata of sandstone and chalk; it only occurs along the project corridor in Cedar County. The Niobrara

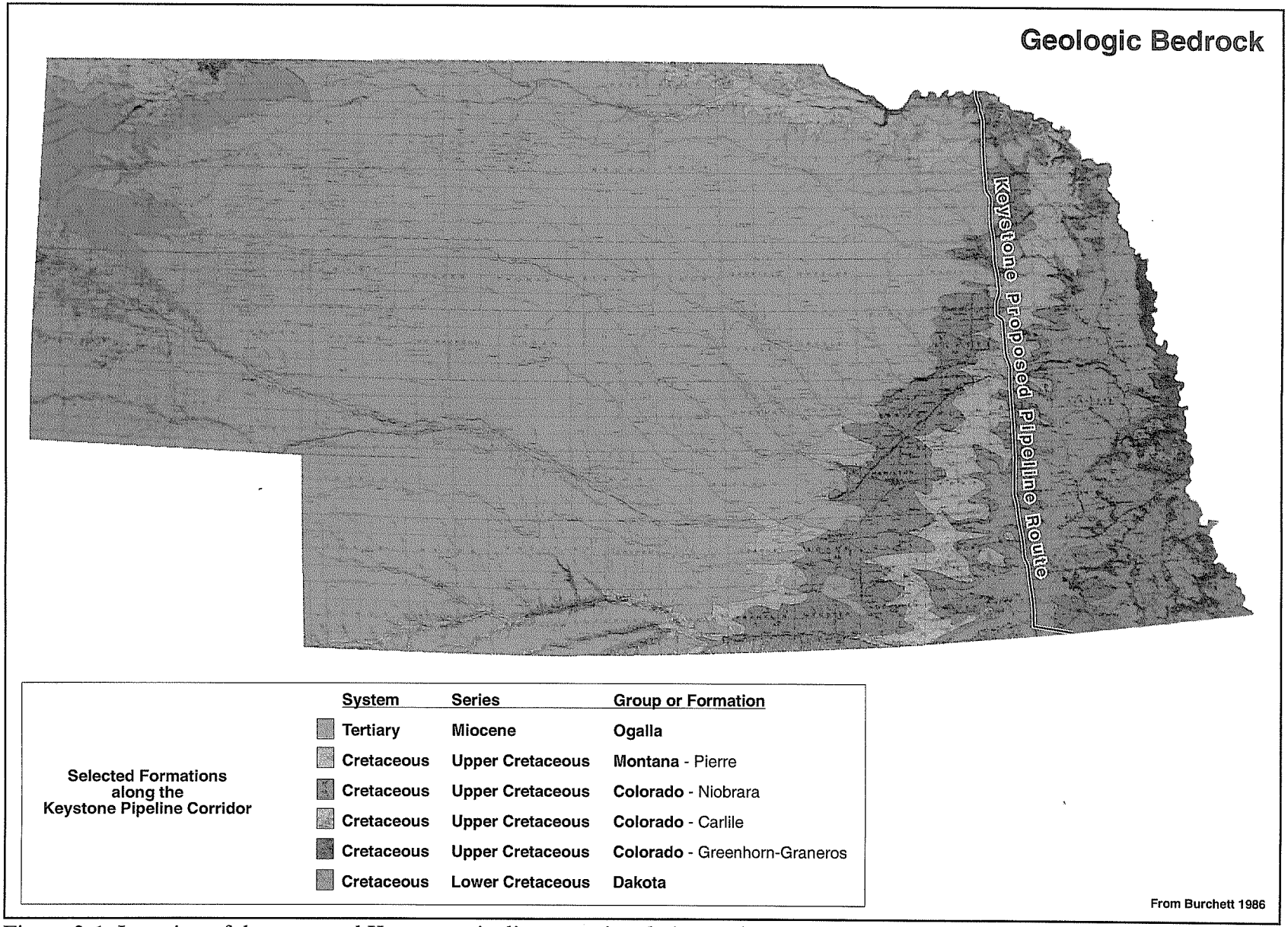

Figure 2-1. Location of the proposed Keystone pipeline route in relation to the general geology of Nebraska.

Formation is an Upper Cretaceous marine chalk which is buff to pure white in color and contains thin layers of flint, 1–2 inches thick, in its upper strata (Cutler 1883). This formation is found in Cedar, Wayne, Stanton, and Platte counties in the project corridor. The Carlile Formation is soft, black, noncalcareous shale which contains minor sandstone layers in the upper portions and chalky deposits in the lower levels. This bedrock is found along the corridor in Stanton, Platte, Colfax, and Butler counties. The Greenhorn-Graneros Formation is a layer of shale (Graneros) overlain by a deposit of both chalk and limestone (Greenhorn). It is the lowest formation associated with the Upper Cretaceous deposits and was found along the project corridor in Colfax, Butler, Seward, and Saline counties. Associated with the Lower Cretaceous period, the Dakota Formation is generally a thin (about 150 feet), highly variable deposit that consists of a lower unit of sandstone or conglomerate, a middle layer of shale and channel sandstone, and an upper layer of marine shale and sandstone. This bedrock is found in Butler and Gage counties and much of Seward, Saline, and Jefferson counties.

Soils

The project corridor crosses 18 different soil associations in Nebraska (Figure 2-2) which differ relative to the local topography (Kuzila and Mack 1990). The following section summarizes the most common soil associations occurring within the project corridor. These soils are described based on the dominant parent material.

Soils north of the Platte River in the northern half of the project corridor consist primarily of the Nora-Crofton-Moody Association and the Nora-Moody-Judson Association. Formed in loess, these tend to be very deep silty well-drained soils on nearly level to strongly sloping uplands (Kuzila and Mack 1990).

South of the Platte River, the soils consist predominately of Hastings-Fillmore, Hastings-Crete-Fillmore, and Crete-Mayberry-Burchard associations. Soils of the Hastings-Fillmore and Hastings-Crete-Fillmore associations formed in loess and are very deep, poorly to moderately well-drained soils found on nearly level to strongly sloping upland surfaces (Kuzila and Mack 1990). The Crete-Mayberry-Burchard Association contains contains very deep, silty to loamy moderately well-drained soils formed in loess and till. These soils are found in the uplands on nearly level to gently sloping surfaces (Kuzila and Mack 1990).

Vegetation

The project corridor crosses five distinct native vegetative zones within Nebraska (Figure 2-3) (Kaul and Rolfsmeier 1993). The Upland Tallgrass Prairie zone covers much of the eastern third of the state and was the primary native vegetation type for most of the project corridor. To a much lesser extent, native vegetation was also associated with the Riparian Forest, Loess Mixed-Grass Prairie, Gravelly Mixed-Grass Prairie, and Lowland Tallgrass Prairie zones.

Upland Tall-Grass Prairie

The Upland Tall-Grass Prairie zone covers approximately the eastern third of Nebraska and gradually integrates with the mixed-grass prairies to the west (Kaul and Rolfsmeier 1993). Grass, pea, and sunflower families dominate the plant species. Typical grasses include big and little bluestems, Indian grass, porcupine-grass, rough and prairie dropseeds, sideoats grama, and switch grass. Species in the pea family include wild clovers, ground-plum, leadplant, wild indigo, scurfy pea, and silver-leaf scurfy pea. Prominent sunflower species in the region include asters, blazing stars, compass plant, golden rods, purple coneflower, stiff sunflower, native thistles, and white sage. Many other plant species are present in lesser concentrations with moisture determining which are most prevalent within the prairie.

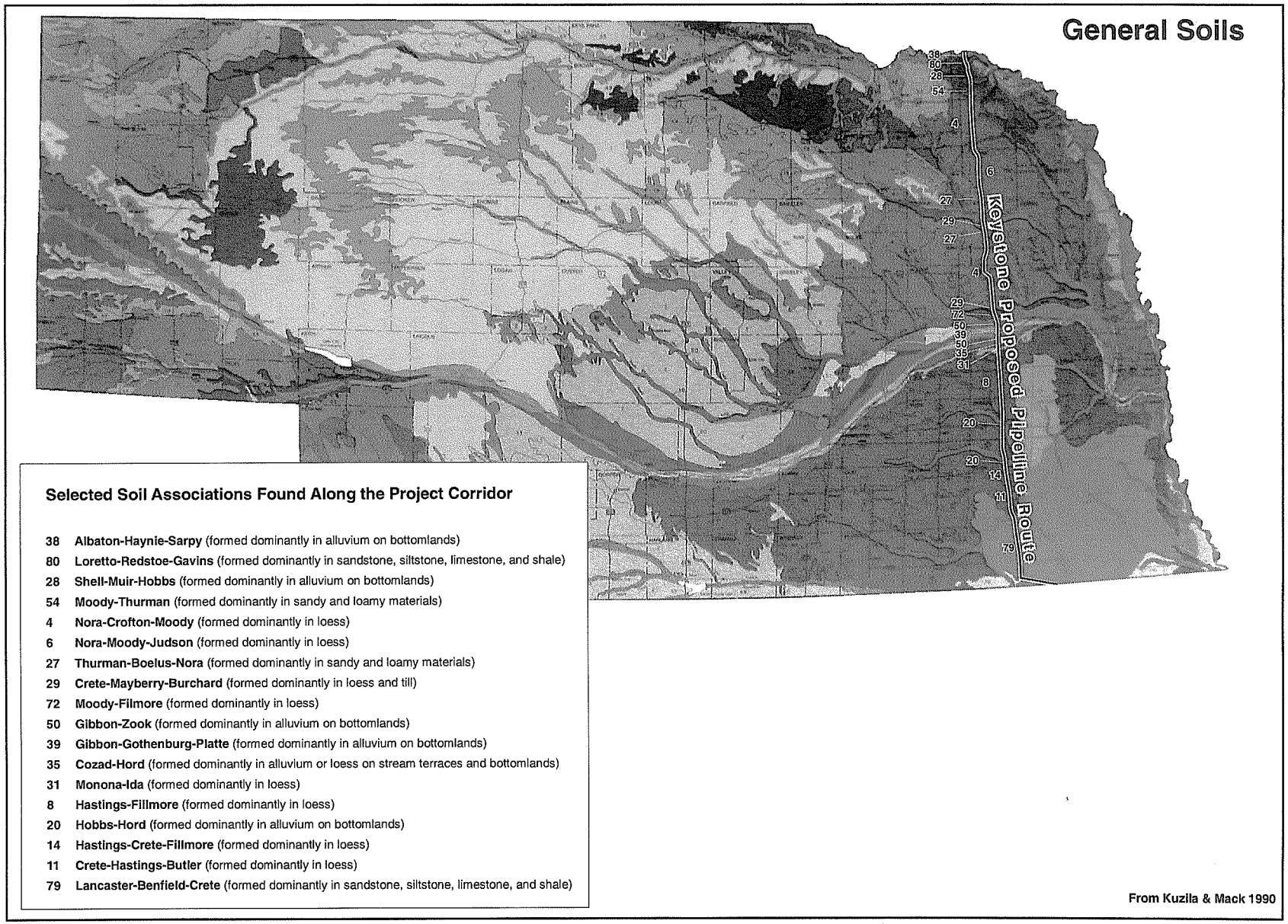

Figure 2-2. Location of the proposed Keystone pipeline route in relation to the general soil associations of Nebraska.

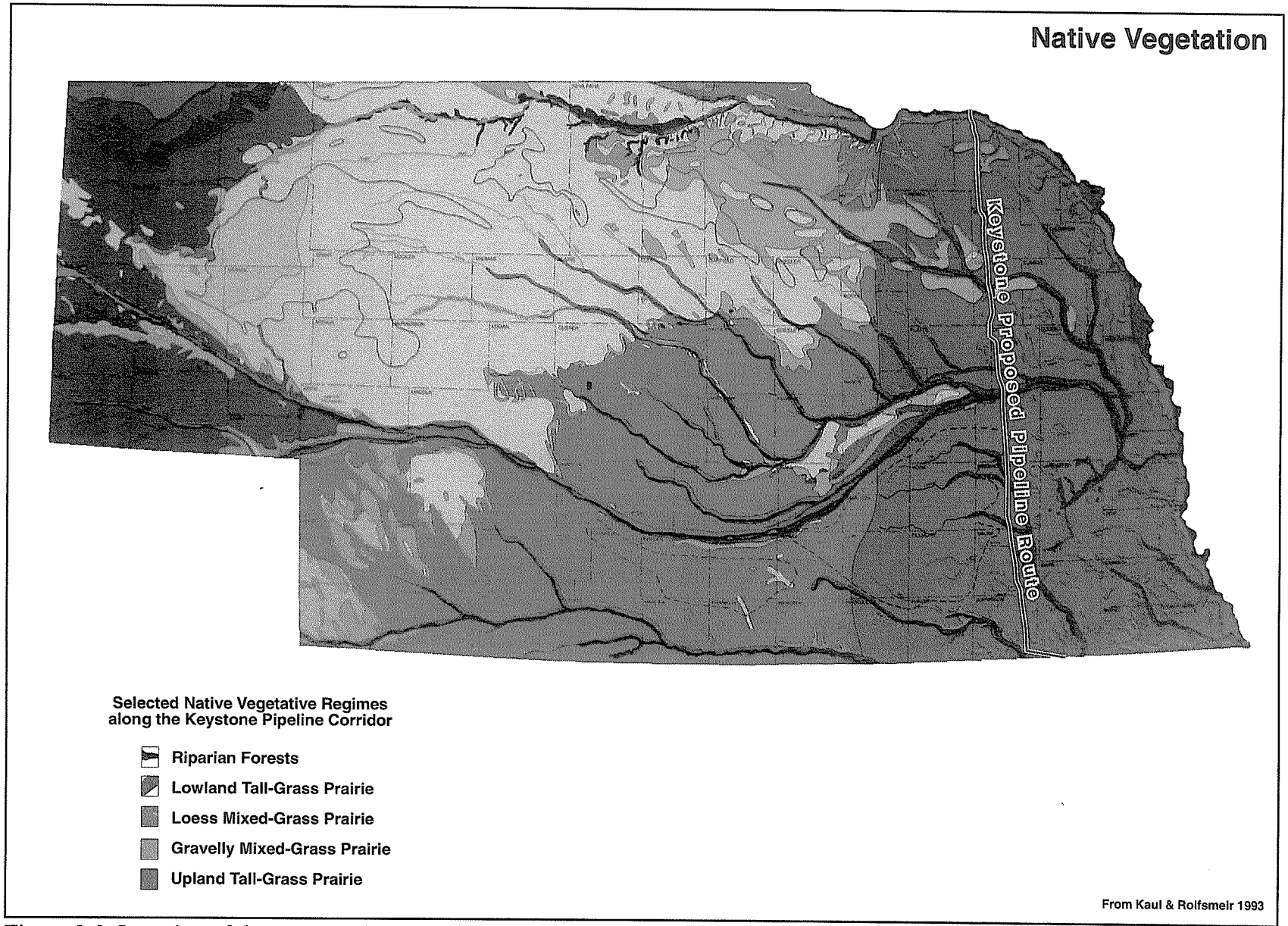

Figure 2-3. Location of the proposed Keystone pipeline route in relation to the natural vegetation of Nebraska.

Riparian Forest

Riparian forests are open woods and dense forests which occur on the valley floors near rivers and creeks (Kaul and Rolfsmeier 1993). Within the project corridor these are located in narrow sections on the floodplains of the Missouri, Elkhorn, Platte, and Blue rivers (Figure 2-3) with vegetation dependent upon disturbance by flowing water. Recently disturbed areas are quickly colonized by trees species such as cottonwood and willow; subsequently, after a period of stability, species such as American elm, box-elder, green ash and blackberry become dominant. Common shrubs include black currant, false indigo, red-osier, and rough leaved dogwoods.

Loess Mixed-Grass Prairie

The project corridor crosses the Loess Mixed-Grass Prairie zone only in northern Cedar County (Figure 2-3). This region is distinguished by both tallgrass and shortgrass prairie with prominent grasses including big bluestem in moist areas and little bluestem in relatively dry areas (Kaul and Rolfsmeier 1993). Other common grasses include blue and sideoats gramas, buffalo grass, green and porcupine needlegrass, Junegrass, needle and thread, plains muhly, purplethree-awn, rough dropseed, and western wheatgrass. Non-grass plant species include forbs such as locoweeds, milkvetches, prairie coneflower, prickly-pear cactus, and yucca.

Lowland Tall-Grass Prairie

The Lowland Tall-Grass Prairie zone occurs in low and moist river valley floors which exhibit sandy soils. In the project area, sections of this vegetation type are found on the floodplain of the Elkhorn, Platte, and Blue rivers (Figure 2-3). Common grasses in this prairie include big bluestem, Indian grass, porcupine-grass, switchgrass, and prairie dropseed. Common sedges and lowland grasses include Canada wild rye and prairie cordgrass. A distinct population of forbes occur in more moist sites which distinguish this zone from the upland prairies. Species include common scouring-rush, cup plant, golden alexanders, Illinois bundleflower, and sawtooth sunflowers.

Gravelly Mixed-Grass Prairie

Cedar County is the only location where a small area of the Gravelly Mixed-Grass Prairie zone occurred (Figure 2-3). This vegetation type is usually found on slopes in infertile, well-drained, sandy-gravelly soils. Vegetation is sparse and includes prickly-pear cactus, sand lovegrass, greenthread, yucca, harsh gerardia, Nuttall's evolvulus, prairie fameflower, prairie sagewort, scale-seed, slender knotweed, spikemoss, smooth sumac, and Virginia ground-cherry (Kaul and Rolfsmeier 1993).

Fauna

Based on the vegetative zones associated with the project corridor, most of the available fauna prior to European settlement would have been native to an upland prairie environment. Exceptions to this would have been in the areas adjacent to the Missouri, Elkhorn, Platte, and Blue rivers which supported fauna associated with a forest environment as well as ones that required a perennial waterway.

Economically important species associated with Nebraska's prehistoric and early historic upland prairie environment included bison, wapiti (elk), mule deer, antelope, and white-tail deer. Other probable important species included: whitetail and blacktail jackrabbit; eastern cottontail rabbit; gopher; opossum; blacktail prairie dog; and coyote. In addition, waterfowl would have been seasonally available in and around prairie rainwater basins which occurred west of the project corridor in Butler, Seward, and Saline counties. Waterfowl available in these basins included numerous species of ducks and geese along with sandhill cranes.

Riverine regions would have provided a different set of animal species available for utilization. These species included white-tail deer, raccoon, mink, eastern fox squirrel, beaver, river otter, muskrat, red fox, and gray fox. Numerous fish species would have also been present including freshwater drum, white crappie, central stoneroller, creek chub, bigmouth buffalo, white sucker, channel catfish, and black bullhead. Waterfowl species would have been available seasonally in these areas.

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