3.7 FISHERIES

The Fisheries section addresses fish species with recreational or commercial significance that occur in waterbodies that would be crossed by the proposed pipeline route as well as waterbodies located within 0.5 mile of the proposed pipeline ROW. Special status fish species including threatened, endangered and species of conservation concern are discussed in Section 3.8.

3.7.1 Fisheries Resources

The evaluated fisheries occur in perennial waterbodies that are located within approximately 0.5 mile of the pipeline ROW and that have been identified by state agencies as having recreational or commercial value. Common fish species with recreational or commercial value that occur across the Project area are listed in Table 3.7.1-1. Many of these species[1] are native North American fishes that have been introduced into watersheds where they did not previously occur to provide for recreational fisheries, while the common carp is an exotic Eurasian introduction.

TABLE 3.7.1-1
Common Recreational and Commercial Fish Associated with Stream Crossings

Species or Group	Status [1]	Montana	South Dakota	Nebraska	Oklahoma	Texas
Atlantic croaker *Micropogonias undulatus*	Commercial					X
Bass (smallmouth, largemouth, spotted) *Micropterus* spp.	Recreational	X	X	X	X	X
Blue catfish *Ictalurus furcatus*	Recreational/ Commercial				X	X
Bluegill *Lepomis macrochirus*	Recreational		X	X	X	X
Brook trout *Salvelinus fontinalis*	Recreational	X	X	X		
Buffalo (bigmouth, smallmouth) *Ictiobus* spp.	Recreational/ Commercial	X	X	X	X	X
Bullheads (black, brown, yellow) *Ameiurus* spp.	Recreational	X	X	X	X	X
Burbot *Lota lota*	Recreational	X				
Common Carp *Cyprinus carpio*	Recreational/ Commercial	X	X	X	X	X
Channel Catfish *Ictalurus punctatus*	Recreational/ Commercial	X	X	X	X	X
Crappie (black, white) *Pomoxis* spp.	Recreational	X	X	X	X	X
Flathead catfish *Pylodictis olivaris*	Recreational/ Commercial		X	X	X	X
Freshwater drum *Aplodinotus grunniens*	Recreational/ Commercial	X	X	X	X	X
Gars (alligator, spotted, longnose)	Recreational				X	X

[1] Common names of fish are used in this section. Scientific names following nomenclature in the NatureServe Explorer database (NatureServe, 2009) for most fish discussed in this section are listed in Table 3.7.1-1. Where fish discussed in this section are not included in Table 3.7.1-1, common names are followed by the scientific name.

TABLE 3.7.1-1 Common Recreational and Commercial Fish Associated with Stream Crossings						
Species or Group	**Status [1]**	**Montana**	**South Dakota**	**Nebraska**	**Oklahoma**	**Texas**
Atractosteus spatula & *Lepisosteus* spp.						
Green sunfish *Lepomis cyanellus*	Recreational	X	X	X	X	X
Minnows (baitfish) Fathead minnow, *Pimephales promelas*; golden shiner, *Notemigonus crysoleucas*; and others	Recreational/ Commercial	X	X	X	X	X
Muskellunge *Esox masuinongy*	Recreational		X	X		
Northern Pike *Esox lucius*	Recreational	X	X	X		
Paddlefish *Polyodon spatula*	MT-SC; BLM-S; TX-T	X			X	X
Pumpkinseed *Lepomis gibbosus*	Recreational	X	X	X	X	X
Rainbow trout *Oncorhynchus mykiss*	Recreational	X	X	X	X	X
Red drum *Sciaenops ocellatus*	Commercial					X
Sauger *Sander canadensis*	MT-SC, BLM-S	X	X	X		
Shad (baitfish) Gizzard shad, *Dorosoma cepedianum*; threadfin shad, *D. petenense*	Commercial		X	X	X	X
Shovelnose sturgeon *Scaphirhynchus platorynchus*	OK-SC, TX-T	X	X	X	X	X
Spotted seatrout *Cynoscion nebulosus*	Recreational					X
Striped bass *Morone saxatilis*	Recreational					X
Sunfish (longear, orangespot, redear, warmouth) *Lepomis* spp.	Recreational	X	X	X	X	X
Walleye *Sander vitreus*	Recreational	X	X	X	X	X
White bass *Morone chrysops*	Recreational				X	X
Yellow Perch *Perca flavescens*	Recreational/ Commercial	X	X	X	X	X

[1] BLM – Bureau of Land Management, MT – Montana, OK – Oklahoma, S – sensitive, SC – species of concern, T – threatened, TX – Texas.

Several fishes that support important recreational or commercial fisheries have declined in abundance and are currently protected within some portions of their range. These fishes are classified as threatened, endangered, or sensitive and include paddlefish, pallid sturgeon (*Scaphirhynchus albus*), sauger, shortnose gar (*Lepisosteus platostomus*), and shovelnose sturgeon. These and other special status fishes are discussed in more detail in Section 3.8.

Spawning periods and habitats for some recreational and commercial fish species in the Project area are shown in Table 3.7.1-2. Fish species are particularly sensitive to habitat disruption caused by construction during spawning periods.

TABLE 3.7.1-2
Recreational and Commercial Fish Spawning Periods and Habitats

Species or Group[1]	Month[2]												Habitat
	J	F	M	A	M	J	J	A	S	O	N	D	
Steele City Segment													
Bass													Shallow areas over clean gravel and sand bottoms.
Brown bullhead *Ameiurus nebulosus*													Spawn in shallow areas by building nests in mud substrate.
Buffalo													Spawn at depths of 4 to 10 feet over gravel or sand substrates.
Bullhead (yellow and black)													Usually spawn in weedy or muddy shallow areas by building nests.
Burbot													Eggs are scattered over sand or gravel substrates.
Common Carp													Adhesive eggs scattered in shallow water over vegetation, debris, logs, or rocks.
Catfish (flathead and blue)													Nest builders with habitat similar to channel catfish.
Channel catfish													Prefers areas with structure such as rock ledges, undercut banks, logs, or other structure where it builds nests.
Crappie													Eggs deposited in depressions on bottom in cove or embayments.
Freshwater drum													Buoyant eggs drift in river currents during development.
Muskellunge													Spawn in tributary streams and shallow lake channels.
Northern pike													Small streams or margins of lakes over submerged vegetation.
Paddlefish													Moves into rivers and spawns over flooded gravel bars.
Sauger													Moves into tributary streams or backwaters where they spawn over rock substrates.
Shad (baitfish)													Spawn in shallow water over sandy/rocky substrates; eggs scattered, adhere to objects.
Shovelnose sturgeon													Spawning occurs in open water channels of large rivers over rocky or gravelly bottoms.
Sunfish													Nest builders in diverse substrates and shallow depths.
Walleye													Spawn in lakes and streams in shallow water over rock substrates.
White bass													Egg masses deposited over sand bars, submerged.
Yellow perch													Shallow open water over weedy areas.
Gulf Coast Segment and Houston Lateral													
Atlantic croaker													Spawning is near shore.

TABLE 3.7.1-2
Recreational and Commercial Fish Spawning Periods and Habitats

Species or Group[1]	Month[2]												Habitat
	J	F	M	A	M	J	J	A	S	O	N	D	
Bass													Males construct a nest in whatever substrate is available but gravel is preferred in depths of 1-15 feet.
Buffalo													Spawn in quiet shallow backwaters or on flooded lands during high water; adhesive eggs deposited over bottom or on vegetation.
Catfish (blue, bullhead, channel, flathead)													Spawning occurs in a dark natural cavity or hole cleaned by the male in an undercut bank, underneath a submerged log or pile of debris.
Crappie													Nests may be located in depths of 1-20 feet, usually in silt-free substrates near a log, stump or aquatic vegetation.
Freshwater drum													Spawns in deep water of open pools.
Gar													Large numbers of individuals congregate in shallow, sluggish pools and backwaters. Adhesive eggs scattered over the substrate and then abandoned.
Minnows (baitfish)													Various strategies, generally adherent eggs with or without nest and parental care.
Red drum													Spawning occurs near shore and inshore waters close to barrier island passes and channels.
Shad (baitfish)													Spawn at night in shallow backwaters; eggs sink and attach to available substrates.
Sunfish													Male builds nest excavating circular depression in diverse substrates, guards nests after spawning.
White and striped bass													Spawn in schools near surface; adhesive eggs (white bass) settle to bottom or semi-buoyant eggs (striped bass) carried by current.

[1] Rainbow trout and brook trout are not included because these species are not likely to spawn in streams crossed by the pipeline route.
[2] Spawning periods are approximate and could occur in only a portion of a particular month.
Sources for general life history: NatureServe (2009); Eddy and Underhill (1974); Harlan et al. (1987); Pflieger (1975); Pflieger (1997); Hoese and Moore (1977); Robison and Buchanan (1988); Thomas et al. (2007); Miller and Robison (2004); Ross (2001); and Pattillo et al. (1997).

Surface water classifications based on a waterbody's water quality and resource values are important elements of fisheries management in each state. The classification systems for each of the states crossed by the proposed pipeline route are administered by the following agencies:

- Montana Department of Environmental Quality (updated 2007);
- South Dakota Department of Environmental and Natural Resources (2004);
- Nebraska Department of Environmental Quality (2006);
- Kansas Department of Health and Environment (2004);
- Oklahoma Water Resources Board (2009); and

- Texas Commission on Environmental Quality (2008).

Fisheries information was derived primarily from fishery distribution maps available on agency websites supplemented by information provided by regional biologists in meetings with Keystone personnel. The Project route would cross 92 perennial streams or rivers (some crossed multiple times) that contain known or potential habitat for fishes of recreational or commercial value. Surface water classifications used to assess potential fisheries resource values of streams either crossed or located within 0.5 miles of the proposed pipeline ROW are provided in Appendix E.

3.7.2 Stream Crossings Descriptions

Table 3.7.2-1 provides the locations of proposed pipeline crossings at perennial streams identified as contributing habitat for recreational and commercial fisheries or crossings upstream from these areas.

TABLE 3.7.2-1
Proposed Perennial Stream Crossings at or Upstream of Fisheries Habitat along the Project Route

County	Approximate Milepost	Waterbody Name – Fishery Rating	Proposed Crossing Technique	Relevant Surface Water or Fishery Class [1]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons) [2]	Number of Crossings
Steele City Segment – Montana							
Valley	25.8	Frenchman Creek	O/C-Dry	Non-Salmonid	Yes	4.6	1
Valley	39.2	Rock Creek	O/C-Dry	Non-Salmonid			1
Valley	40.4	Willow Creek	O/C-Dry	Non-Salmonid			1
Valley	82.7	Milk River	HDD	Non-Salmonid			1
McCone	89.0	Missouri River – ***Red Ribbon, Class II Recreational Fishery***	HDD	Marginal-Salmonid	Yes	11.4	1
McCone	93.8	West Fork Lost Creek	O/C-Wet	Non-Salmonid			1
McCone	94.6	Tributary West Fork Lost Creek	O/C-Wet	Non-Salmonid			1
McCone	127.6	East Fork Prairie Elk Creek	O/C-Wet	Non-Salmonid			1
McCone	146.6	Redwater River	O/C-Dry	Non-Salmonid	Yes	8.0	1
McCone	147.5 – 153.3	Buffalo Springs Creek	O/C-Wet	Non-Salmonid			3
Dawson	159.2	Berry Creek	O/C-Wet	Non-Salmonid			1
Dawson	175.2	Clear Creek	O/C-Wet	Non-Salmonid			1
Dawson	195.7 – 196.0	Yellowstone River – ***Blue Ribbon, Class I Recreational Fishery***	HDD	Non-Salmonid,	Yes	11.6	2
Prairie	201.4 – 202.0	Cabin Creek	O/C-Dry	Non-Salmonid			2
Fallon	226.9 – 227.7	Dry Fork Creek	O/C-Wet	Non-Salmonid			5
Fallon	234.5	Pennel Creek	O/C-Wet	Non-Salmonid			1
Fallon	262.4	Little Beaver Creek	O/C-Dry	Non-Salmonid			1
Fallon	281.4	Boxelder Creek	O/C-Dry	Non-Salmonid	Yes	7.4	1
Steele City Segment – South Dakota							
Harding	292.1	Little Missouri River	HDD	WW Semiperm			1

TABLE 3.7.2-1
Proposed Perennial Stream Crossings at or Upstream of Fisheries Habitat along the Project Route

County	Approximate Milepost	Waterbody Name – Fishery Rating	Proposed Crossing Technique	Relevant Surface Water or Fishery Class [1]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons) [2]	Number of Crossings
Harding	318.1	South Fork Grand River	O/C-Wet	WW Semiperm			1
Harding	323.4	Clark's Fork Creek	O/C-Wet	WW Marginal			1
Butte	356.5	North Fork Moreau River	O/C-Wet	WW Marginal	Yes	7.4	1
Perkins	364.4	South Fork Moreau River	O/C-Wet	WW Marginal			1
Meade	399.6	Sulfur Creek	O/C-Wet	WW Marginal			1
Pennington	425.9	Cheyenne River	HDD	WW Perm	Yes	11.4	1
Hakkon	443.6	West Plum Creek	O/C-Wet	WW Marginal			1
Hakkon	481.3	Bad River	O/C-Wet	WW Marginal			1
Tripp	536.9	White River	HDD	WW Semiperm	Yes	6.5	1
Steele City Segment – Nebraska							
Keya Paha	599.8	Keya Paha River	HDD	Class A WW			1
Keya Paha	604.0	Spring Creek	O/C-Wet	Class B CW			1
Rock	615.3	Niobrara River	HDD	Class A WW	Yes	12.4	1
Holt	630.2; 659.9	South Fork Elkhorn River	O/C-Wet	Class A WW			2
Holt	647.0	Holt Creek	O/C-Wet	Class A WW			1
Wheeler	696.5	Cedar River	HDD	Class A WW	Yes	12.0	1
Nance	727.6	South Branch Timber Creek	O/C-Wet	Class B WW			1
Nance	739.8	Loup River	HDD	Class A WW			1
Merrick	746.2	Prairie Creek	O/C-Wet	Class B WW			1
Merrick	755.4 – 755.7	Platte River	HDD	Class A WW			1
York	764.6	Big Blue River	O/C-Wet	Class B WW			1
York	774.1	Lincoln Creek	O/C-Wet	Class B WW			1
York	779.3	Beaver Creek	O/C-Wet	Class B WW			1

TABLE 3.7.2-1
Proposed Perennial Stream Crossings at or Upstream of Fisheries Habitat along the Project Route

County	Approximate Milepost	Waterbody Name – Fishery Rating	Proposed Crossing Technique	Relevant Surface Water or Fishery Class [1]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons) [2]	Number of Crossings
York	788.7	West Fork Big Blue River	O/C-Wet	Class A WW	Yes	11.7	1
Filmore	807.5	Turkey Creek	O/C-Wet	Class B WW			1
Keystone Cushing Extension Pump Stations – Kansas							
N/A							
Gulf Coast Segment – Oklahoma							
Creek	22.3	Deep Fork River	HDD	WW AC			1
Okfuskee	24.2	Pettiquah Creek	O/C-Wet	WW AC			1
Okfuskee	38.7	North Canadian River	HDD	WW AC	Yes	31.5 (part)	1
Seminole	43.7	Sand Creek	O/C-Wet	WW AC			1
Seminole	48.1	Little Wewoka Creek	O/C-Wet	WW AC			1
Seminole	58.9	Wewoka Creek	O/C-Wet	WW AC			1
Hughes	66.9	Bird Creek	O/C-Wet	WW AC			1
Hughes	70.5	Little River	HDD	WW AC			1
Hughes	74.2	[South] Canadian River	HDD	WW AC	Yes	31.5 (part)	1
Coal	87.4	Muddy Boggy Creek	O/C-Wet	WW AC			1
Coal	99.4	Owl Creek	O/C-Wet	WW AC			1
Coal	102.6	Little Caney Boggy Creek	O/C-Wet	WW AC			1
Atoka	122.4	Fronterhouse Creek	O/C-Wet	WW AC			1
Atoka	126.6	Clear Boggy Creek	HDD	WW AC			3
Atoka	131.0	Cowpen Creek	O/C-Wet	WW AC			1
Gulf Coast Segment – Oklahoma / Texas Border (single crossing)							
Bryan Fannin	155.3	Red River	HDD	WW AC High	Yes	33.3 (part)	1

TABLE 3.7.2-1
Proposed Perennial Stream Crossings at or Upstream of Fisheries Habitat along the Project Route

County	Approximate Milepost	Waterbody Name – Fishery Rating	Proposed Crossing Technique	Relevant Surface Water or Fishery Class [1]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons) [2]	Number of Crossings
Gulf Coast Segment – Texas							
Lamar	170.4	Sanders Creek	O/C-Wet	High			1
Lamar	172.3	Cottonwood Creek	O/C-Wet	High			1
Lamar	189.1	Justiss Creek	O/C-Wet	High			1
Lamar	190.2	North Sulphur River	HDD	High	Yes	33.3 (part)	1
Delta	201.2	South Sulphur River	HDD	High	Yes	33.3 (part)	1
Hopkins	212.3	White Oak Creek	HDD	High			1
Hopkins	211.6	Crosstimber Creek	O/C-Wet	High			1
Franklin	232.0	Brushy Creek	O/C-Wet	High			1
Franklin	226.1 – 226.2	Little Cypress Creek	O/C-Wet	High			2
Franklin	227.6	Big Cypress Creek	HDD	High			1
Wood	234.0	Sand Branch	O/C-Wet	High			1
Upshur	256.1	Big Sandy Creek	HDD	High			1
Upshur	262.7	Sabine River	HDD	High	Yes	32.3 (part)	1
Rusk	300.4	Johnson Creek	O/C-Wet	High			1
Rusk	310.9	Angelina River[3]	O/C-Wet	High			1
Rusk	312.2 – 312.3	East Fork Angelina River	HDD	High	Yes	32.3 (part)	3
Nacogdoches	315.7	Indian Creek	O/C-Wet	High			1
Nacogdoches	333.3	Angelina River[3]	HDD	High	Yes	19.7 (part)	1
Angelina	346.9	Bodan Creek	O/C-Wet	High			1
Angelina	352.3	Crawford Creek	O/C-Wet	High			1
Angelina	359.9	Hurricane [Cedar] Creek	O/C-Wet	High			1
Angelina	367.3	Neches River	HDD	High	Yes	19.7 (part)	1

TABLE 3.7.2-1
Proposed Perennial Stream Crossings at or Upstream of Fisheries Habitat along the Project Route

County	Approximate Milepost	Waterbody Name – Fishery Rating	Proposed Crossing Technique	Relevant Surface Water or Fishery Class [1]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons) [2]	Number of Crossings
Polk	374.0	Piney Creek	O/C-Wet	High			1
Polk	383.1 – 384.8	Bundix Branch	O/C-Wet	High			2
Polk	386.0 – 386.8	Big Sandy Creek	O/C-Wet	High			4
Polk	401.5	Menard Creek	HDD	High	Yes	3.0	1
Hardin	446.5	Pine Island Bayou	O/C-Wet	High			1
Hardin	436.9 – 438.2	Mayhaw Creek	O/C-Wet	High			2
Jefferson	455.4	Cotton Creek	O/C-Wet	High			1
Jefferson	459.2	Neches Valley Canal Authority	HDD	High			1
Jefferson	459.9	Lower Neches Valley Canal Authority	HDD	High			1
Houston Lateral – Texas							
Liberty	22.8	Trinity River	HDD	High	Yes	10.6	1
Harris	35.6	Cedar Bayou	HDD	High			1
Harris	43.3	San Jacinto River	HDD	High	Yes	1.8	1

1 Surface water classifications and associated fisheries classifications are described within the state-by-state sections.

2 Hydrostatic test waters identified with a volume and (part) indicate that a part of this total volume amount would be obtained from this individual source.

3 The Angelina River is crossed in two different locations, once by O/C-Wet and once by HDD.
O/C-Wet = Open Cut Wet Method (flowing or non-flowing)
HDD = Horizontal Directional Drill
O/C-Dry = Open Cut Dry Method (flume or dam-and-pump)
AC = Aquatic Community
CW = Cold Water Fish
WW = Warm Water Fish
Non-Salmonid = Non-Salmonid Fishery
Marginal-Salmonid = Marginal-Salmonid Fishery
Marginal-Salmonid = Marginal-Salmonid Fishery
Semiperm = Semipermanent

Perm = Permanent
Class A = Provides habitat for year-round maintenance of one or more identified key species
Class B = Provides habitat where the variety of warmwater biota is limited by water volume or flow, water quality, substrate composition or other habitat conditions
High = Recreational or Commercial Fishery of High Value
N/A = Not Applicable

3.7.2.1 Steele City Segment

The Steele City Segment of the Project would extend from the Canadian border near Morgan, Montana southeast to Steele City, Nebraska. Recreationally or commercially important fish along the Steele City Segment include bass, catfish, northern pike, paddlefish, sauger, shovelnose sturgeon, sunfish, walleye, and yellow perch (Table 3.7.1-1). General spawning periods for common recreational and commercial fishes are listed in Table 3.7.1-2. Recreational and commercial fish occurrence, fishery or water quality classifications, and notable fishery resources in each State along the proposed pipeline corridor are summarized in the following sections.

Montana

Montana distinguishes surface water classifications based on their ability to support cold-water (salmonid) or warm-water (non-salmonid) aquatic life (MDEQ 2006a). The perennial streams potentially crossed by the Project are classified as supporting non-salmonid fisheries, except for the Missouri River crossing below Fort Peck dam which is classified as marginal for supporting salmonid fisheries. The Missouri River east of Fort Peck Reservoir to the border of Richland County is classified as a Red Ribbon – Class II Recreational Fishery; or a recreational fishery of high value. Salmonid fish supported by this fishery include: brown trout (*Salmo trutta*), mountain whitefish (*Prosopium williamsoni*), and rainbow trout. The reach of the Yellowstone River through Prairie County is classified as a Blue Ribbon – Class I Recreational Fishery, or a recreational fishery of outstanding value. Non-salmonid fish supported by this fishery include burbot, channel catfish, paddlefish, sauger, smallmouth bass, and walleye. Protected recreational fisheries species that potentially occur in the vicinity of the Missouri River and Yellowstone River crossings in Montana include: paddlefish, pallid sturgeon, and sauger. Shortnose gar potentially occur in the vicinity of the Missouri River crossing, and sauger may occur in the vicinity of the Frenchman Creek and Boxelder Creek crossings.

The Project would cross 18 perennial streams in Montana that support recreational or commercial fisheries (Table 3.7.2-1). Three of these perennial waterbodies, the Milk River (MP 82.7), the Missouri River (MP 89.0), and the Yellowstone River (MP 196.0) would be crossed using the Horizontal Directional Drill (HDD) technology. As part of the Yellowstone River HDD crossing, a perennial side channel of the Yellowstone River at MP 195.7 would also be crossed. All other perennial stream crossings in Montana would use either the open-cut wet crossing methodology or an open-cut dry crossing methodology.

Three fisheries streams would be crossed multiple times: Buffalo Springs Creek – at MP 147.5, MP 153.2, and MP 153.3; Cabin Creek –at MP 201.4 and MP 202.0, and Dry Fork Creek – at MP 226.9, MP 227.0, MP 227.1, MP 227.4, and MP 227.7. Cabin Creek is perennial at both crossing locations, while Buffalo Springs Creek and Dry Fork Creek include crossings within intermittent and ephemeral reaches of these streams, respectively.

South Dakota

South Dakota also classifies surface waters as supporting coldwater and warmwater fish and on the ability to support propagation of these fisheries within the waterbody (SDDENR 2008). Warmwater classes are subdivided into permanent fish life propagation, semipermanent fish life propagation and marginal fish life propagation (SDDENR 2008). All 10 perennial streams crossed by the Project in South Dakota are classified as supporting warmwater fisheries. These include one permanent warmwater fishery (Cheyenne River), three semi-permanent warmwater fisheries (Little Missouri, South Fork Grand, and White rivers), and six marginal warmwater fisheries (Table 3.7.2-1). Common recreational fish found in these streams include catfish, walleye, sauger, bullheads, and bass (South Dakota State University, 2001).

The Project would cross 10 perennial streams in South Dakota that support recreational or commercial fisheries (Table 3.7.2-1). Three of these perennial waterbodies, the Little Missouri River (MP 292.1), the Cheyenne River (MP 425.9), and the White River (MP 536.9) would be crossed using the HDD method. All other perennial stream crossings in South Dakota would use either the open-cut wet crossing methodology or an open-cut dry crossing methodology.

Nebraska

Nebraska classifies surface waters as supporting coldwater and warmwater fish and as providing habitat for year-round maintenance of one or more identified key species (Class A) or as providing habitat where the variety of warmwater biota is limited by water volume or flow, water quality, substrate composition or other habitat conditions (Class B, NEDEQ 2006). Key species are those identified as endangered, threatened, sensitive or recreationally-important aquatic species. The Project crosses one coldwater stream, Spring Creek, that is rated as a Class B water. Coldwater fish that may be maintained year-round by stocking in Spring Creek could include brook trout, brown trout, or rainbow trout. Of the 14 crossings of warmwater streams 8 are rated Class A and 6 are rated Class B (Table 3.7.2-1). Common recreationally-important warmwater fish include catfish, bass, crappie, sauger, shovelnose sturgeon, sunfish, walleye, and yellow perch. In addition, forage fish (bait fish) important for the federally endangered interior least tern are found in the Platte, Niobrara, and Loup Rivers.

The Project would cross 15 perennial streams in Nebraska that support recreationally-important fisheries (Table 3.7.2-1). Five of these waterbodies would be crossed using the HDD methodology, including: the Keya Paha River (MP 599.8), the Niobrara River (MP 615.3), the Cedar River (MP 696.5), the Loup River (MP 739.8), and the Platte River (MP 755.4). All other perennial stream crossings in Nebraska would use either the open-cut wet crossing methodology or an open-cut dry crossing methodology. One perennial fisheries stream would be crossed twice by the proposed pipeline corridor: South Fork Elkhorn River – at MP 630.2 and MP 659.9.

3.7.2.2 Cushing Extension Pump Stations

Kansas

Two new pump stations would be constructed along the Cushing Extension in Kansas to support the Project. No perennial streams would be impacted and construction would be completed using roads in upland areas. No aquatic impacts are expected from construction and operation of the new pump stations.

3.7.2.3 Gulf Coast Segment and Houston Lateral

Perennial streams along the Gulf Coast Segment and Houston Lateral proposed pipeline corridor support warmwater fishes including black bass, catfish, drum, gar, minnow, shad, sucker, sunfish, and temperate bass in freshwater dominated systems. Rivers with connection to estuarine systems may also include Atlantic croaker, red drum, and spotted seatrout. Typical streams within the South Central Plain Ecoregion support diverse communities of indigenous or introduced fishes. Fish communities are dominated by sunfishes, darters and minnows and are characterized by a number of sensitive species

Oklahoma

Oklahoma uses four classifications to sustain and manage its fisheries: Habitat Limited Aquatic Community, Warm Water Aquatic Community, Cool Water Aquatic Community, and Trout Fishery (OWRB 2009). Waters crossed by the pipeline corridor have been determined to be either Category 1 waters (adequate to support climax fish communities and Warm Water Aquatic Communities) or

Category 2 waters (not adequate to support a Warm Water Aquatic Community and Habitat Limited Aquatic Communities). Habitat Limited Aquatic Communities generally reside within intermittent and ephemeral streams. Common recreationally-important warmwater fish include bass, catfish, crappie, gar, sunfish, walleye, white bass, and yellow perch. Protected recreational fisheries species that potentially occur in the vicinity of the Red River crossing include paddlefish and shovelnose sturgeon.

The proposed pipeline corridor in Oklahoma would cross 16 perennial streams that support recreational or commercial fisheries (Table 3.7.2-1). Six of these streams would be crossed using the HDD methodology, including: the Deep Fork River (MP 22.1), the North Canadian River (MP 38.7), the Little River (MP 70.5), the South Canadian River (MP 74.2), Clear Boggy Creek (MP 126.7), and the Red River (MP 155.3). The main channel, an oxbow, and an overflow channel of Clear Boggy Creek would all be crossed using a single HDD. All other perennial stream crossings in Oklahoma would use either the open-cut wet crossing methodology or an open-cut dry crossing methodology.

Texas

Texas surface water categories establish the conditions necessary to provide a level of water quality necessary for the support, protection and propagation of aquatic life (TNRCC 2000). Exceptional, high, intermediate and limited aquatic life use categories have been described to set the benchmark for measure of species/habitat diversity. Unless otherwise classified, aquatic life use and criteria are presumed based on the stream flow type – perennial, intermittent with perennial pools, or intermittent. Unclassified perennial streams, rivers, lakes, estuaries, and other appropriate perennial waters are presumed to have high aquatic life use in accordance with ecoregion studies, dissolved oxygen (DO) criteria, and trophic structure. Unclassified intermittent streams with perennial pools suitable to support significant aquatic life are presumed to have limited aquatic life use; and intermittent streams with perennial pools not adequate to support aquatic life are presumed to have minimal aquatic life use. High aquatic life use habitats support a highly diverse and usual association of regionally expected species. This may include the presence of sensitive aquatic animals, high species diversity, high species richness, and a balanced to slightly imbalanced trophic structure. Intermediate aquatic life use supports moderately diverse aquatic communities with some expected species present, sensitive species very low in abundance, moderate species diversity, moderate species richness and a moderately imbalanced trophic structure. High aquatic life use designated waters crossed by the Project in Texas are presented in Table 3.7.3-1; intermediate aquatic life use waters crossed by the Project were not included in the fisheries evaluation. Sensitive recreational fish, paddlefish and shovelnose sturgeon, occur in the Red River, which forms the border between Oklahoma and Texas. The Red River would be crossed using HDD from Oklahoma to Texas

The Texas portion of the Gulf Coast Segment would cross 32 perennial waters that support recreational or commercial fisheries (Table 3.7.2-1). Twelve of these crossings would use the HDD crossing methodology (note that the total number of HDD crossings in Texas along the Gulf Coast Segment includes five additional crossings of waterbodies that do not support recreational or commercial fisheries). These crossings are:

- North Sulphur River (MP 190.2);
- South Sulphur River (MP 201.2);
- White Oak Creek (MP 212.3);
- Big Cypress Creek (MP 227.6);
- Big Sandy Creek (MP 256.1);
- Sabine River (MP 262.7);

- East Fork Angelina River (MP 312.3);
- Angelina River (MP 333.3);
- Neches River (MP 367.3);
- Menard Creek (MP 413.8);
- Neches Valley Canal (MP 459.7); and
- Lower Neches Valley Canal (MP 459.9).

The Angelina River would be crossed twice, at MP 310.9 using an open cut method and at MP 333.3 using HDD. The multiple perennial channels of the East Fork Angelina River between MP 312.2 and MP 312.3 would be crossed by a single HDD. All other crossings of perennial streams that support recreational or commercial fisheries in Texas along the Gulf Coast Segment of the proposed pipeline would use either the open-cut wet crossing methodology or an open-cut dry crossing methodology.

Four other fisheries streams along the proposed Gulf Coast Segment in Texas would be crossed multiple times across perennial and intermittent channels: Little Cypress Creek – at MP 226.1 and 226.2; Bundix Branch – at MP 383.1 and 384.8; Big Sandy Creek – at MP 386.0, MP 386.7. MP 386.8, and MP 387.1; and Mayhaw Creek – at MP 436.9 and MP 438.2.

The Houston Lateral Segment would cross 3 high aquatic life use perennial streams that support recreational or commercial fisheries (Table 3.7.2-1). These streams include the Trinity River (MP 22.8), the Cedar Bayou (MP 35.6), and the San Jacinto River (MP 43.3) and they would each be crossed using the HDD method (note that one waterbody crossing along the Houston Lateral Segment that does not support recreational or commercial fisheries would also be crossed using HDD methodology). The lower reaches of the San Jacinto River and Trinity River are likely to contain fish associated with estuarine and nearshore marine habitats such as Atlantic croaker, red drum, spotted seatrout, and striped bass.

3.7.3 Potential Impacts and Mitigation

Potential impacts and mitigations for fisheries resources associated with construction and operation of the pipeline system are addressed in this section. However, impacts and mitigations associated with potential spills of oil or other hazardous substances are addressed in Section 3.13.

3.7.3.1 Pipeline Construction Impacts

Stream Crossings

Open-Cut Crossings

Potential impacts resulting from all open-cut crossing methods include disturbance of the streambed resulting in impacts to subsurface macroinvertebrates and potential interference with hyporheic flows. Construction would result in a reduction of habitat, alteration of habitat structure, alteration of substrate and bank structure in the ROW, and changes in the benthic invertebrate community (Levesque and Dube 2007, Brown et al. 2002, Chutter 1969, Cordone and Kelley 1961).

Removal of bank vegetation leads to bank instability and erosion. Loss of riparian vegetation reduces shading causing an increase in water temperature and reduces dissolved oxygen, reduces nutrient input, and reduces hiding cover (Brown et al. 2002, Ohmart and Anderson 1988). A reduction in cover can increase vulnerability of certain species to predation, as they lose the ability to hide from predators. Loss

of riparian vegetation and disturbance to the bank and substrate can alter benthic communities and change food availability (Brown et al. 2002). Loss of overhead riparian vegetation can also cause increased solar input. Replacement of riparian vegetation upon construction completion, and the limited extent of riparian vegetation loss (ROW width) and absence of water in intermittent or seasonal streams, will minimize risks to increased temperature.

All open-cut methods could potentially increase sedimentation during construction and result in bank erosion until erosion control measures are implemented and the bank stabilizes. Sedimentation would depend upon characteristics of the stream and adjacent uplands. Excessive suspended sediments can interfere with respiration in fish and invertebrates, leading to mortality or reduced productivity in rearing and spawning (Newcombe and Jensen 1996, Sutherland 2007, Wood and Armitage 1997). Suspended sediments can impair foraging efficiency for species that are visual predators. These impacts would be short in duration. Long-term effects may occur if sediment deposits cover eggs or young fish, causing increased mortality and reducing recruitment to the population (Newcomb and MacDonald 1991). Where the water table is shallow and exposed, trenching in the stream could cause a local increase in water temperature which could result in reduced water quality and damage to fish and macroinvertebrates.

Introduced non-native species can compete with native species and transmit diseases (e.g., whirling disease) that could adversely impact sensitive species. Invasive aquatic species can be introduced into waterways and wetlands and spread by improperly cleaned vehicles and equipment operating in water, stream channel, or wetlands (Cowie and Robinson 2003, Fuller 2003). While numerous invasive fishes occur within waters crossed by the Project, construction of the Project is not likely to cause introduction or spread of invasive fishes. The whirling disease (*Myxobolus cerebralis*) in salmonids is caused by a protozoan parasite that has a resistant myxospore stage. Myxospores can be transmitted in mud from infected streams on equipment used in water and on vehicles between watersheds. Whirling disease occurs in over 100 different streams with only a few major river drainages uninfected in Montana (Montana Aquatic Nuisance Species Technical Committee, 2002).

New Zealand mudsnails (*Potamopyrgus antipodarum*) have been reported from the Big Horn River drainage, a tributary to the Yellowstone River, in Montana (Benson 2009a) which is not close to the Project. Quagga mussels (*Dreissena rostriformis bugensis*) have been reported from the South Platte River, a tributary to the Platte River in Nebraska (Benson 2009b) which is not close to the Project. Zebra mussels (*Dreissena polymorpha*) have been reported in the Arkansas River drainage and the Red River drainage in Oklahoma and Texas (Benson 2009c). Both drainages are crossed by the Project in the vicinity of reported occurrences.

Open-Cut Wet Crossing

Construction of a non-flowing open-cut crossing is the most rapid and least impacting of the open-cut methods, primarily because water is not flowing in the streambed and sediments are not transported downstream. Post construction erosion control practices described in Keystone's CMR Plan including revegetation, soil compaction, and sloping may provide enhanced soil stability features than are found upstream or downstream from the crossing. No impacts are expected to fisheries resources from a non-flowing open-cut wet crossing method.

Construction of flowing open-cut wet crossings may result in short-term impacts including direct mortality to fishery and aquatic resources. Sediment released during trenching of the pipeline crossings would be transported by the water flowing through the trench and has the potential to affect downstream aquatic life and habitat through either direct exposure or sediment deposition (Schubert et al. 1985, Anderson et al. 1996, Reid at al. 2004). Biological effects associated with fine sediment on fishes can vary and include gill irritation, avoidance behaviors, stress, and in extreme cases of long durations of

exposure to suspended sediments can have lethal effects on individuals (Newcombe and MacDonald 1991, Wood and Armitage 1997, Waters 1995). Potential impacts include scouring of downstream areas or streambed disturbance if streambed modifications occur.

Open-Cut Dry Crossing

Open-cut dry crossing methods are used when crossing selected environmentally sensitive waterbodies. Flowing open-cut dry flumes have a moderate potential to temporarily affect fishery resources, possibly resulting in behavioral changes such as avoidance or stress on individuals. Pump failure during flowing open-cut dam and pump crossings may result in overtopping of the coffer dam causing erosion and subsequent transport of suspended and fine sediment. Keystone has committed to using a pump that maintains 1.5 times the ambient flow rate at the time of construction. At least one back up pump would be available on site and coffer dams would be constructed with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner). Intake hoses would be screened to prevent entrainment of fish although microinvertebrates may be transferred through the pump. Flowing open-cut dam and pump crossings have a moderate potential to temporarily affect fishery resources. Dam and pump crossings may block or delay normal fish movements. Short-term delays in movements of spawning migrations could have adverse impacts on fisheries, however, most crossings of streams less than 50 feet would be completed in less than 2 days and potential impacts would be minor.

Horizontal Directional Drill Crossing

Successful HDD crossings would avoid direct disturbance to aquatic habitat and stream banks. This method of stream crossing likely would avoid affects to those recreational or commercial fisheries that occur at the river or stream crossings (AFS 2009, MFWP 2009). Drilling fluids and additives used during implementation of a directional drill would be non-toxic to the aquatic environment (Keystone 2008, see CMR Plan). Although unintended consequences may have short-term or long-term negative effects on fishes and aquatic invertebrates, HDD remains the crossing method with the least likelihood of negative impacts.

Impacts could occur if there is unintended release of drilling fluids due to site geological conditions (a frac-out) or a problem with containment or disposal of drilling muds. A frac-out could release bentonitic drilling mud into the aquatic environment. Frac-outs in aquatic environments are difficult to contain primarily because drilling mud readily disperses in flowing water and quickly settles in standing water. Although bentonite is non-toxic, suspended bentonite may inhibit respiration of fishes and aquatic invertebrates due to fouled gills during the short-term. Long-term effects can result from bentonite if larval fish are covered and suffocate due to fouled gills and/or lack of oxygen. Egg masses of fish could be covered by a layer of bentonite inhibiting the flow of dissolved oxygen to the egg masses. Benthic invertebrates and the larval stages of pelagic organisms may be covered and suffocate.

A contingency plan to address a frac-out during HDD including preventative and response measures to control the inadvertent release of drilling lubricant would be maintained (Keystone 2009c). The contingency plan would include instructions for downstream monitoring for any signs of drilling fluid during drilling operations and would describe the response plan and mitigation in the event that a release of drilling fluids occurred. Drill cuttings and drilling mud would be disposed according to environmental permitting and disposal options may include spreading over the construction ROW in an upland location or hauling to an approved licensed landfill or other approved sites.

Hydrostatic Testing (Water Withdrawal and Replacement)

Water used for hydrostatic testing of the pipeline would be obtained from surface water resources. All surface water withdrawals would comply with permit regulations and would not exceed volumes or rates specified in the permits. Small quantities of water would also potentially be withdrawn from fisheries streams for HDD, roadway and construction site dust control or for other uses.

Water withdrawal for hydrostatic testing would likely occur in the fall for the Steele City Segment and would avoid spawning periods for most recreationally important fishes (Table 3.7.1-2). Water withdrawal for hydrostatic testing would likely occur between mid-March and the end of September for the Gulf Coast Segment and Houston Lateral and would coincide with spawning periods for all freshwater recreationally or commercially-important fishes (Table 3.7.1-2). Water withdrawal could entrain eggs, small fish, and drifting macroinvertebrates. Recreationally or commercially-important fishes occurring in waters proposed as sources for hydrostatic test-water include paddlefish, sauger, shortnose gar, or shovelnose sturgeon at Frenchman Creek, Missouri River, Yellowstone River, and Boxelder Creek in Montana; and at the Red River in Oklahoma and Texas.

The volume of water required to test a 50-mile section of 36-inch pipe would be approximately 14 million gallons (43 acre feet). Depending on locations, state requirements, and water availability, water would be obtained and withdrawn from nearby streams or privately owned reservoirs. Twenty-three fisheries streams have been identified as potential water sources for hydrostatic testing (Table 3.7.2-1). If water is withdrawn from a sensitive surface water source during a low-flow period or at a time when particular flow ranges are needed for other uses, habitat reductions for fisheries and aquatic invertebrates could occur. A similar effect on fisheries habitat could occur if large withdrawals are made from aquifer zones that provide late-season baseflows to streams. Water use for hydrostatic testing would be a one-time use and water withdrawal rates would be controlled to be less than 10 percent of the base flow at the time of testing. In some instances sufficient quantities of water may not be available from the permitted water sources at the time of testing. Withdrawal rates may be limited as stated by the permit. Alternate water sources would need approval from state regulators and any required analyses would occur prior to pipe filling. Impacts on fish habitat would be considered minor in intermediate and major streams. Minor waterbodies generally would not contain sufficient water for use in hydrostatic testing.

There is the potential for transferring aquatic invasive species to other areas of the same water source during hydrostatic test water use. In areas where zebra mussels are known to occur, Keystone has committed to thoroughly cleaning all equipment used during the withdrawal and discharge of water prior to use at subsequent test locations to prevent the transfer of this invasive species to new locations. The potential for transferring aquatic invasive species can be minimized through same basin use within a short distance of the withdrawal area or through water sampling to identify and avoid species transfer. The discharge of hydrostatic test water following state permit requirements would reduce the potential spread of invasive species and disease transfer effects on sensitive species. Withdrawal pumps would be equipped with 500 mesh (.001 in, .025 mm, 25μ) screens capable of stopping macroinvertebrates, but not the early larval stages of microinvertebrate, viral, bacterial, or parasitic pathogens. Additionally, the Project's hydrostatic test water would be returned to the same source or to the same general vicinity.

In some locations, hydrostatic test water would be discharged to upland locations within the same basin, relying on infiltration for eventual return to the basin. In other locations, water would be returned to its waterbody of origin. Proportionally high discharge volumes to source areas could displace fish or disrupt spawning, rearing or foraging behavior (Manny 1984). Discharged water may dislodge sediment, leading to an increase in suspended sediment. The discharge of large volumes of hydrostatic test waters into surface waters could temporarily cause a change in the water temperature and DO levels, could increase downstream flows, and could increase streambank and substrate scour. Guidelines for water discharge in

overland areas and absorption back through the ground would allow water temperatures to reach pre-withdrawal conditions prior to entering streams.

Keystone would be responsible for acquiring all permits required by federal, state and local agencies for procurement of water and for the discharge of water used in the hydrostatic testing operation. Any water obtained or discharged would be in compliance with permit notice requirements and with sufficient notice for Keystone's Testing Inspector to make water sample arrangements prior to obtaining or discharging water. Keystone would obtain water samples for analysis from each source before filling the pipeline. In addition, water samples would be taken prior to discharge of the water, as required by state and federal permits. NPDES permits are required for the discharge of both hydrostatic testing fluids and any water obtained during construction dewatering. Both of these activities can be authorized under an NPDES General Permit for Hydrostatic Testing and an NDPES General Permit for Dewatering. EPA Regions 6, 7 and 8 would issue a Section 402, CWA NPDES permit for the discharge of hydrostatic test water.

Upland Trenching

Disturbance to upland plant communities and environment can have direct impacts on aquatic habitats through sedimentation due to wind and water erosion, and a reduction in filtering capacity and infiltration of runoff due to reduced vegetative cover. While effects of upland disturbance on aquatic habitat can be immediate, there can also be seasonal time lags until effects are realized such as storm/flood events occurring later.

Blasting

Blasting operations could occur on or near potential waterbody crossings containing important fisheries in Montana, South Dakota, Nebraska, Oklahoma, and Texas. Potentially affected waterbodies include Buffalo Springs Creek and the Yellowstone River in Montana; the Little Missouri River, South Fork Grand River, and West Plum Creek in South Dakota; the Niobrara River in Nebraska; the Little River and Little Caney Boggy Creek in Oklahoma; and Cottonwood Creek, Brushy Creek, Sand Branch, Sabine River, and Mayhaw Creek in Texas. Streamside blasting could indirectly affect fish and aquatic invertebrates; effects include increased sedimentation, noise, vibrations, and alteration of channel morphology (Wright and Hopky 1998). Blasting in or near waterbodies can cause direct negative impacts on fish populations due to mortality associated with shockwaves propagating through the water (Teleki and Chamberlain 1978, Wright and Hopky 1998). The proposed blasting operations and mitigation measures are discussed in more detail in Section 3.1.1.2.

3.7.3.2 Pump Stations and Tank Farm Construction Impacts

The Project consists of installing and operating aboveground facilities consisting of 28 new pump stations on the Steele City and Gulf Coast segments, and two new pump stations on the Keystone Cushing Extension. The Project also consists of installation and operation of a tank farm, consisting of three tanks, at Steele City, Nebraska. Ten acres of land would be disturbed along the existing Cushing Extension in Kansas during the construction of two additional pump stations and construction of new permanent access roads. Two pump stations in the Project (within the Texas Gulf Coast Segment) are located in flood zones. Impacts to fisheries from these activities would be minor since the relatively small footprint in relation to pervious surface poses minimal potential impacts to fisheries habitat from overland runoff to streams.

3.7.3.3 Project Operational Impacts

Invasive Weed Control

Herbicides would be used to control vegetation before and after construction. The use of herbicides near a waterbody could harm aquatic organisms, including protected fish. Herbicides could enter a waterbody through runoff, seepage through the soil, and direct introduction to water during application through overspray or wind drift.

Soil Stabilization

Bank soils that are restored post construction may be vulnerable to erosion from soil aggregate destruction during the first few years prior to vegetation establishment and soil consolidation, leading to impacts to fisheries habitat. As soil water freezes and expands, it increases soil volume by freezing moisture in small pore spaces and pushes soil particles above the level of the original soil surface. Northern project states such as Montana, South Dakota and Nebraska are most vulnerable to this local freeze-thaw erosion issue during ensuing spring runoffs.

Maintenance

To reduce potential impacts to sensitive aquatic resources as a result of maintenance activities, Keystone would consult with the appropriate state wildlife or land management agency prior to the initiation of maintenance activities beyond standard inspection measures.

3.7.3.4 Summary of Mitigation

To reduce the potential impacts to fisheries habitat caused by the removal of riparian cover, vegetation would be cut off at ground level, leaving the existing root systems in place to provide streambank stability. Pulling of tree stumps and rooting for grading activities would be limited to the area directly over the trench line in riparian areas. After construction is complete, the banks of the waterbodies would be stabilized with temporary sediment barriers within 24 hours of completing construction activities and most minor and intermediate waterbody crossings would be completed within 2 to 3 days. Where conditions allow, riparian vegetation would be restored with native plant species or conservation grasses and legumes. In the event that a water body crossing is located within or adjacent to a wetland crossing, wetland crossing mitigation measures would be implemented to the extent practicable. Some of the more critical elements of the CMR Plan are consolidated below.

During construction, significant measures include use of HDD to prevent direct disturbance to larger river habitats and the fishery and aquatic species that occupy those habitats and planners working with agencies as necessary to further define fish spawning periods and construction schedules to avoid, to the extent practicable, in-stream activities during sensitive periods. In addition, the CMR Plan outlines stream channel restoration, bank restoration, and revegetation methods that rehabilitate affected areas. Compliance with all state water quality regulations during construction contributes to minimizing potential effects on fishery resources.

Herbicides would not be used within 100 feet of a wetland or waterbody minimizing potential exposure and impacts to aquatic and fishery resources.

Routine aerial and ground surveillance inspections would be used to identify areas of erosion, exposed pipeline and nearby construction activities. These practices would allow for early identification of bank

stability problems and would minimize the potential for continuing environmental effects during pipeline operation.

Keystone's proposed mitigation measures would result in the Project having a low potential to adversely affect recreationally or commercially-important fisheries as a result of construction and normal operation. The combined efforts of fish life history stage timing considerations, construction impact mitigation, site specific crossing techniques, seasonal conditions, contingency plans, water quality testing, and water quality compliance result in a low potential effect on fisheries resources from construction and normal operation. For affects associated with oil and hazardous substance releases, see Section 3.13.

3.7.4 Connected Actions

3.7.4.1 Power Distribution Lines and Substations

Approximately 6.6 miles of riverine or open water habitats could be affected during construction and operation of new power distribution lines to pump stations for the Project in Montana, South Dakota, Nebraska, Kansas, and Oklahoma (Tables 3.7.4-1 and 3.7.4-2). The primary impacts on waterbodies would be related to clearing or removing the existing riparian vegetation in the construction work area and the maintained ROW. Preliminary siting of power lines indicates that the number of perennial streams potentially containing recreationally- and commercially-important fish that would be crossed ranges from 2 to 8 for the states crossed by the Project (Table 3.7.4-1).

TABLE 3.7.4-1
Number of Waterbody Crossings for Proposed Power Distribution Lines to Pump Stations for the Project

Waterbody Classification	Montana	South Dakota	Nebraska	Kansas	Oklahoma	Texas
Perennial	8	8	3	2	3	2
Intermittent	51	126	48	17	7	3
Total	*59*	*134*	*51*	*19*	*10*	*5*

Source: Keystone, 2008.

In general, distribution line construction impacts to waterbodies would be minor, as many lines would be co-located alongside existing roadways or ROWs and power lines would be installed by local providers under local permitting requirements. Compliance with federal, state and local agency requirements for water crossings ensures that the most feasible and least-impacting activities are performed at the site.

3.7.4.2 Lower Brule to Witten 230-kV Transmission Line

Upgrades to the power grid in South Dakota to support power requirements for pump stations in South Dakota would include a new 230-kV transmission line, that would be constructed and operated by the Basin Electric Power Cooperative (BEPC) and a new substation that would be constructed by Western and owned and operated by BEPC. As described in Section 4.4 of the EIS, Western and BEPC have identified two alternative corridors ('A' and 'B') for the proposed Lower Brule to Witten 230-kV transmission line project, and there are several route options within each corridor.

The number of waterbodies crossed by the route options within the two alternative corridors for the power grid upgrade are shown in Tables 3.7.4-2 and 3.7.4-3. The transmission line route options under alternative corridor A would cross the Missouri River, the White River, and between 26 and 36 intermittent streams (Table 3.7.4-2). The transmission line route options under alternative corridor B

would cross the Missouri River, the White River, and between 20 and 31 intermittent streams (Table 3.7.4-3). Construction and operation impacts on waterbodies potentially containing fisheries would be the same as for the distribution lines discussed above; however, it is likely that the poles would be larger and that the area disturbed around the installation site would likely be larger.

TABLE 3.7.4-2
Number of Waterbody Crossings for Proposed Lower Brule to Witten 230-kV Transmission Line Corridor A Alternatives for the Project

Waterbody Classification	Western	BEPC-A	BEPC-B	BEPC-C	BEPC-D
Perennial	1	4	4	4	4
Intermittent	33	34	36	35	26
Total	*34*	*38*	*40*	*39*	*30*

TABLE 3.7.4-3
Number of Waterbody Crossings for Proposed Lower Brule to Witten 230-kV Transmission Line Corridor B Alternatives for the Project

Waterbody Classification	BEPC-E	BEPC-F	BEPC-G	BEPC-H
Perennial	3	4	7	7
Intermittent	23	25	31	20
Total	*26*	*29*	*38*	*27*

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