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. The types of waterbodies discussed in this section include lakes, ponds, rivers, and perennial, intermittent, and ephemeral streams. Special status fish species including threatened, endangered, and species of conservation concern are discussed in Section 3.8. Section 3.6 discusses terrestrial wildlife resources, many of which may use fish as a prey source.

3.7.1 Fisheries Resources

The evaluated fisheries occur in 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 proposed 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[a]	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

[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[a]**	**Montana**	**South Dakota**	**Nebraska**	**Oklahoma**	**Texas**
Freshwater drum *Aplodinotus grunniens*	Recreational /Commercial	X	X	X	X	X
Gars (alligator, spotted, longnose) *Atractosteus spatula* & *Lepisosteus* spp.	Recreational				X	X
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
Shortnose gar *Lepisosteus platostomus*	MT-SC	X	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

[a] 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, and shovelnose sturgeon. These and other special status fishes are discussed in more detail in Section 3.8 and in Appendix I.

Spawning periods and habitats for some recreational and commercial fish species in the proposed Project area are shown in Table 3.7.1-2. Fish species are particularly sensitive to habitat disruption caused by construction during spawning periods. Spawning periods for fishes that range across the length of the proposed Project will vary depending on latitude. After spawning, the type and length of habitat use for larval and juvenile fish rearing varies depending on the fish species, life history stage, and site-specific conditions. Eggs would be expected to hatch relatively soon after spawning activities (for example, 6 to 9 days for brown bullhead and 3 to 16 days for common carp). Therefore, use of these waterbodies for larval rearing would be expected to overlap and extend beyond the identified spawning periods in Table 3.7.1-2.

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

	Month[b]												
Species or Group[a]	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Habitat**
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 (bigmouth, smallmouth)													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.

TABLE 3.7.1-2 Recreational and Commercial Fish Spawning Periods and Habitats													
	Month[b]												
Species or Group[a]	J	F	M	A	M	J	J	A	S	O	N	D	Habitat
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.
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.

[a] Rainbow trout and brook trout are not included because these species are not likely to spawn in streams crossed by the pipeline route.

[b] 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. The proposed Project route would involve 317 perennial waterbody crossings (including multiple lakes) and 564 intermittent waterbody crossings. Of these waterbodies, the proposed Project route would cross 207 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. Section 3.7.2 below discusses the perennial crossings for each state, the proposed crossing method, and the presence or absence of a fishery of special concern based on state surface water classifications.

3.7.2 Fisheries of Concern

This section addresses fisheries potentially found in perennial streams (including rivers) that would be crossed by the pipeline route. Although intermittent waterbodies may be of substantial value in terms of fisheries resources, they are not addressed in this section because information is not available for these waterbodies and fisheries impacts are expected to be minimal because they do not typically contain water year-round. Cold water (trout and salmon), coolwater (walleye, yellow perch, northern pike), and warm water fisheries (Ictaluridae – catfish and bullheads, Centrarchidae – sunfish, Cyprinidae – carp, and Moronidae – temperate bass) are present in the proposed Project area.

Fisheries management in each state incorporates the state's surface water classification systems. The classifications are based on a waterbody's water quality and resource value and are intended to create an estimate of the potential use. 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 proposed Project waterbody crossings upstream from these areas.

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Steele City Segment – Montana							
Phillips	25.4	Frenchman Creek	O/C-Dry	Non-Salmonid	Yes	4.6	1
Valley	39.2	Rock Creek	O/C-Dry	Non-Salmonid			1
Valley	40.5	Willow Creek	O/C-Dry	Non-Salmonid			1
Valley	82.9	Milk River	HDD	Non-Salmonid			1
Valley/McCone	89.2 to 89.3	Missouri River	HDD	Marginal-Salmonid / Red Ribbon, Class II Recreational Fishery	Yes	11.4	1
McCone	93.9	Unnamed Tributary to Struple Coulee	O/C-Wet	Non-Salmonid			1
McCone	94.9	Unnamed tributary of Jorgensen Coulee	O/C-Wet	Non-Salmonid			1
McCone	128.0	East Fork Prairie Elk Creek	O/C-Wet	Non-Salmonid			1
McCone	147.0	Redwater River	O/C-Dry	Non-Salmonid	Yes	8.0	1
McCone	153.7	Buffalo Springs Creek	O/C-Wet	Non-Salmonid			1
Dawson	159.6	Berry Creek	O/C-Wet	Non-Salmonid			1
Dawson	175.6	Clear Creek	O/C-Wet	Non-Salmonid			1
Dawson	196.1	Side Channel of Yellowstone River	HDD	Non-Salmonid			
Dawson	196.4	Yellowstone River	HDD	Non-Salmonid/ Blue Ribbon, Class I Recreational Fishery	Yes	11.6	1
Fallon	234.7	Pennel Creek	O/C-Wet	Non-Salmonid			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Fallon	236.0	Unnamed tributary to Pennel Creek	O/C-Wet	Non-Salmonid			1
Fallon	262.7	Little Beaver Creek	O/C-Dry	Non-Salmonid			1
Fallon	281.5	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
Harding	318.1	South Fork Grand River	O/C-Wet	WW Semiperm			1
Harding	322.9	Clark's Fork Creek	O/C-Wet	WW Marginal			1
Harding	328.9	West Squaw Creek	O/C-Wet	Fish Propagation			1
Harding	353.1	Unnamed tributary to North Fork Moreau River	O/C-Wet	Fish Propagation			4
Butte	356.9	North Fork Moreau River	O/C-Wet	WW Marginal	Yes	7.4	1
Perkins	364.8	South Fork Moreau River	O/C-Wet	WW Marginal			1
Meade	383.7	Pine Creek	O/C-Wet	WW Marginal			1
Meade	408.9	Red Owl Creek	O/C-Wet	WW Marginal			1
Meade	425.4	Narcelle Creek	O/C-Wet	Fish Propagation			1
Pennington	426.1	Cheyenne River	HDD	WW Perm	Yes	11.4	1
Haakon	429.1	Bridger Creek	O/C-Wet	Fish Propagation			1
Hakkon	443.8	West Plum Creek	O/C-Wet	WW Marginal			1
Haakon	479.3	Mitchell Creek	O/C-Wet	Fish Propagation			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Hakkon	481.5	Bad River	O/C-Wet	WW Marginal			1
Lyman/Tripp	537.1	White River	HDD	WW Semiperm	Yes	6.5	1
Steele City Segment – Nebraska							
Keya Paha	599.9	Keya Paha River	O/C-Wet	Class A WW			1
Keya Paha	604.2	Spring Creek	O/C-Wet	Class B CW			1
Keya Paha/Rock	615.4 to 651.6	Niobrara River	HDD	Class A WW	Yes	12.4	1
Holt	630.5	South Fork Elkhorn River	O/C-Wet	Class A WW			1
Holt	647.3	Holt Creek	O/C-Wet	Class A WW			1
Holt	660.2	South Fork Elkhorn River	O/C-wet	Class A WW			1
Wheeler	697.3	Cedar River	HDD	Class A WW	Yes	12.0	1
Nance	728.5	South Branch Timber Creek	O/C-Wet	Class B WW			1
Nance	729.7	Unnamed tributary to South Branch Timber Creek	O/C-Wet	Class B WW			2
Nance	738.6	Fullerton Canal	O/C-Wet	Class A WW			1
Nance	740.7	Loup River	HDD	Class A WW			1
Merrick	747.1	Prairie Creek	O/C-Wet	Class B WW			1
Merrick	755.7	Warm Slough	O/C-Wet	Class A WW			1
Merrick	756.3 to 756.5	Platte River	HDD	Class A WW			1
Merrick	758.1 to 758.2	Unnamed tributary to Platte River	O/C-Wet	Class A WW			2
York	765.5	Big Blue River	O/C-Wet	Class B WW			1
York	774.9	Lincoln Creek	O/C-Wet	Class B WW			1
York	780.2	Beaver Creek	O/C-Wet	Class B WW			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
York	789.6	West Fork Big Blue River	O/C-Wet	Class A WW	Yes	11.7	1
Fillmore	807.5	Unnamed tributary to Turkey Creek	O/C-Wet	Class B WW			1
Filmore	808.6	Turkey Creek	O/C-Wet	Class B WW			1
Cushing Extension Pump Stations – Kansas							
N/A							
Gulf Coast Segment – Oklahoma							
Lincoln	1.2	Wildhorse Creek	O/C-Wet	WW AC			1
Lincoln	2.5	Turkey Creek	O/C-Wet	WW AC			1
Lincoln	2.9	Unnamed Tributary to Euchee Creek	O/C-Wet	WW AC			1
Lincoln	3.3	Unnamed Tributary of Euchee Creek	O/C-Wet	WW AC			1
Lincoln	7.0	Unnamed Tributary to Camp Creek	O/C-Wet	WW AC			1
Lincoln	7.8	Unnamed tributary to Camp Creek	O/C-Wet	WW AC			1
Lincoln	14.1	Salt Creek	O/C-Wet	WW AC			1
Lincoln	14.8 to 15.3	Unnamed tributary to Salt Creek	O/C-Wet	WW AC			2
Creek	19.5	Unnamed Tributary to Deep Fork River	O/C-Wet	WW AC			2
Creek	22.2	Deep Fork River	HDD	WW AC	Yes	6.6	1
Okfuskee	24.0	Pettiquah Creek	O/C-Wet	WW AC			1
Okfuskee	28.3	Little Hilliby Creek	O/C-Wet	WW AC			1
Okfuskee	30.4	Hillibly	O/C-Wet	WW AC			1
Okfuskee	32.7	Unnamed tributary to Hilliby Creek	O/C-Wet	WW AC			1
Okfuskee	38.3	Unnamed Tributary to North Canadian River	O/C-Wet	WW AC			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Okfuskee/ Seminole	38.6	North Canadian River	HDD	WW AC	Yes	0.3	1
Seminole	39.9	Tributary to North Canadian River	O/C-Wet	WW AC			1
Seminole	43.5	Sand Creek	O/C-Wet	WW AC			1
Seminole	46.8	Unnamed tributary to Little Wewoka Creek	O/C-Wet	WW AC			1
Seminole	47.3	Unnamed tributary to Little Wewoka Creek	O/C-Wet	WW AC			1
Seminole	48.0	Little Wewoka Creek	O/C-Wet	WW AC			1
Seminole	50.0	Unnamed Tributary to Little Wewoka Creek	O/C-Wet	WW AC			2
Seminole	52.4	Unnamed tributary to Long George Creek	O/C-Wet	WW AC			1
Seminole	58.7	Wewoka Creek	O/C-Wet	WW AC			1
Hughes	59.8 to 60.3	Jacobs Creek	O/C-Wet	WW AC			3
Hughes	67.2	Bird Creek	O/C-Wet	WW AC			1
Hughes	70.4	Little River	HDD	WW AC	Yes	21.6	1
Hughes	73.0	Unnamed tributary to Little River	O/C-Wet	WW AC			1
Hughes	74.1	South Canadian River	HDD	WW AC	Yes	0.6	1
Hughes	74.7	Unnamed tributary to Canadian River	O/C-Wet	WW AC			1
Hughes	79.6	Unnamed Tributary to Big Sandy Creek	O/C-Wet	WW AC			2
Hughes	80.2	Unnamed tributary to Big Sandy Creek	O/C-Wet	WW AC			1
Coal	87.3	Muddy Boggy Creek	O/C-Wet	WW AC			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Coal	95.0	Unnamed tributary to Turkey Creek	O/C-Wet	WW AC			1
Coal	96.1	Unnamed tributary to Turkey Creek	O/C-Wet	WW AC			1
Coal	102.3	Unnamed tributary to Little Caney Boggy Creek	O/C-Wet	WW AC			1
Coal	102.7	Unnamed tributary to Little Caney Boggy Creek	O/C-Wet	WW AC			1
Coal	111.1	Unnamed tributary to Coal Creek	O/C-Wet	WW AC			1
Atoka	119.2	Unnamed tributary to Fronterhouse Creek	O/C-Wet	WW AC			1
Atoka	122.6	Fronterhouse Creek	HDD	WW AC			1
Atoka	123.1	Unnamed tributary to Fronterhouse Creek	O/C-Wet	WW AC			1
Atoka	124.1	Unnamed tributary to Fronterhouse Creek	O/C-Wet	WW AC			1
Atoka	125.6	Unnamed Tributary to Clear Boggy Creek	O/C-Wet	WW AC			1
Atoka	126.2	Unnamed Tributary to Clear Boggy Creek	O/C-Wet	WW AC			1
Atoka	126.9	Clear Boggy Creek	HDD	WW AC	Yes	18.0	1
Atoka	127.1 to 127.3	Unnamed Tributary to Clear Boggy Creek	O/C-Wet	WW AC			1
Atoka	129.5	Unnamed Tributary to Clear Boggy Creek	O/C-Wet	WW AC			1
Atoka	131.3	Cowpen Creek	O/C-Wet	WW AC			1
Bryan	133.2	Unnamed tributary to Long Branch Creek	O/C-Wet	WW AC			1
Bryan	155.6	Unnamed tributary to Red River	O/C-Wet	WW AC			1

TABLE 3.7.2-1 Proposed Perennial Stream Crossings at or Upstream[a] of Fisheries Habitat along the Proposed Project Route							
County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Gulf Coast Segment – Oklahoma / Texas Border (single crossing)							
Bryan/ Fannin	155.7 to 155.8	Red River	HDD	WW AC High	Yes	9.3	1
Gulf Coast Segment – Texas							
Fannin	158.5	Unnamed tributary to Red River	O/C-Wet	High			1
Fannin/Lamar	162.0	Bois D'Arc Creek	HDD	High			1
Lamar	165.7	Unnamed tributary to Slough Creek	O/C-Wet	High			2
Lamar	166.2	Slough Creek	O/C-Wet	High			1
Lamar	169.3	Shooter Creek	O/C-Wet	High			1
Lamar	170.9	Unnamed tributary to Sanders Creek	O/C-Wet	High			1
Lamar	171.2	Sanders Creek	O/C-Wet	High			1
Lamar	172.7	Cottonwood Creek	O/C-Wet	High			1
Lamar	174.2	Unnamed tributary to Doss Creek	O/C-Wet	High			1
Lamar/Delta	190.8	North Sulphur River	HDD	High	Yes	13.0	1
Delta/Hopkins	201.7 to 201.8	South Sulphur River	HDD	High	Yes	0.4	1
Hopkins	212.1	Crosstimber creek	O/C-Wet	High			2
Hopkins	212.8	White Oak Creek	HDD	High			1
Hopkins	217.2	Unnamed tributary to Stouts Creek	O/C-Wet	High			1
Hopkins	218.2	Stouts Creek	O/C-Wet	High			1
Hopkins	220.9	Greenwood Creek	O/C-Wet	High			1
Franklin	224.2	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Franklin	226.7, 226.8	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			2
Franklin	228.5	Big Cypress Creek	HDD	High			1
Franklin	232.7	Brushy Creek	O/C-Wet	High			1
Franklin	232.8, 233.1	Unnamed tributary to Brushy Creek	O/C-Wet	High			2
Wood	234.1	Unnamed tributary to Briary Creek	O/C-Wet	High			1
Wood	234.6	Sand Branch	O/C-Wet	High			1
Wood	235.1	Unnamed tributary to Briary Creek	O/C-Wet	High			1
Wood	235.5	Unnamed tributary to Briary Creek	O/C-Wet	High			1
Wood	242.7	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			1
Wood	243.9	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			1
Wood	244.9	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			1
Wood	245.4	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			2
Wood	246.6	Unnamed tributary to Little Cypress Creek	O/C-Wet	High			1
Wood	248.0	Unnamed tributary to Clear Creek	O/C-Wet	High			2
Wood	253.0	Blue Branch	O/C-Wet	High			1
Wood	254.9	Private Lake	HDD	High			1
Wood	255.2	Perin Branch	O/C-Wet	High			1
Wood/Upshur	256.9	Big Sandy Creek	HDD	High			1
Upshur/Smith	263.5	Sabine River	HDD	High	Yes	17.0	1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Smith	267.9	Unnamed tributary to Simpson Creek	O/C-Wet	High			1
Smith	268.9	Simpson Creek	O/C-Wet	High			1
Smith	270.7, 270.8	Unnamed tributary to Simpson Creek	O/C-Wet	High			2
Smith	272.1	Unnamed tributary to Sunstroke Creek	O/C-Wet	High			1
Smith	275.1	Unnamed tributary to Prairie Creek	O/C-Wet	High			1
Smith	275.5	Prairie Creek	O/C-Wet	High			1
Smith	277.3	Unknown tributary to Mud Creek	O/C-Wet	High			1
Smith	277.7	Unknown tributary to Mud Creek	O/C-Wet	High			1
Smith	279.7	Unknown tributary to Mud Creek	O/C-Wet	High			1
Smith	280.7	Unnamed tributary to Caney Creek	O/C-Wet	High			1
Smith	283.1, 283.5	Unnamed tributary to Caney Creek	O/C-Wet	High			2
Smith	283.5	Caney Creek	O/C-Wet	High			1
Smith	284.6	Unnamed tributary to Caney Creek	O/C-Wet	High			1
Smith	286.8	Unnamed tributary to Kickapoo Creek	O/C-Wet	High			1
Cherokee	297.6	Unnamed tributary to Mills Creek	O/C-Wet	High			2
Rusk	31.3	Johnson Creek	O/C-Wet	High			1
Rusk	308.3	Wheelus Branch	O/C-Wet	High			1
Rusk	313.3	East Fork Angelina River	HDD	High	Yes	8.6	1
Nacogdoches	316.7	Indian Creek	O/C-Wet	High			1
Nacogdoches	319.3	Unnamed tributary to Beech Creek	O/C-Wet	High			4

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Nacogdoches	320.3	Unnamed tributary to Beech Creek	O/C-Wet	High			3
Nacogdoches	320.8	Beech Creek	O/C-Wet	High			3
Nacogdoches/ Cherokee	334.2	Angelina River[4]	HDD	High	Yes	17.4	1
Angelina	342.5	Red Bayou	O/C-Wet	High			1
Angelina	344.9	Watson Branch	O/C-Wet	High			1
Angelina	345.6	Unnamed tributary to Watson Branch	O/C-Wet	High			3
Angelina	347.8	Red Bayou	O/C-Wet	High			1
Angelina	351.0	Buncombe Creek	O/C-Wet	High			1
Angelina	351.2	Unnamed tributary to Buncombe Creek	O/C-Wet	High			2
Angelina	352.2	Unnamed tributary to Neches River	O/C-Wet	High			1
Angelina	353.3	Crawford Creek	O/C-Wet	High			1
Angelina	355.5	Unnamed tributary to Neches River	O/C-Wet	High			1
Angelina	358.2	Unnamed tributary to Neches River	O/C-Wet	High			1
Angelina	360.7	Unnamed tributary to Jack Creek	O/C-Wet	High			4
Angelina	360.9	Jack Creek	O/C-Wet	High			4
Angelina	361.1	Cedar Creek	O/C-Wet	High			2
Angelina	362.8	Unnamed tributary to Neches River	O/C-Wet	High			2
Angelina/Polk	368.6	Neches River	HDD	High	Yes	22.1	1
Polk	376.4	Piney Creek	O/C-Wet	High			2
Polk	376.7	Unnamed tributary to Piney Creek	O/C-Wet	High			4
Polk	377.7	Unnamed tributary to Bear Creek	O/C-Wet	High			1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
Polk	377.9	Bear Creek	O/C-Wet	High			1
Polk	381.5	Unnamed tributary to Jones Creek	O/C-Wet	High			1
Polk	381.9	Jones Creek	O/C-Wet	High			1
Polk	382.6	Brushy Creek	O/C-Wet	High			1
Polk	385.6	Bundix Branch	O/C-Wet	High			1
Polk	388.5	Big Sandy Creek	O/C-Wet	High			3
Polk	389.7	Big Sandy Creek	O/C-Wet	High			1
Polk	391.7	Big Sandy Creek	O/C-Wet	High			1
Polk	397.2	East Menard Creek	O/C-Wet	High			1
Polk	401.4	Unnamed tributary to Bluff Creek	O/C-Wet	High			1
Polk	404.1	Menard Creek	O/C-Wet	High			1
Polk	407.1	Unnamed tributary to Dry Branch	O/C-Wet	High			2
Polk	415.3	Unnamed tributary to Bear Foot Lake	O/C-Wet	High			3
Liberty	416.4	Menard Creek	HDD	High			1
Liberty	439.5	Mayhaw Creek	O/C-Wet	High			1
Hardin	449.0	Pine Island Bayou	HDD	High	Yes	0.2	1
Liberty	451.6	Pine Island Bayou	O/C-Wet	High			1
Jefferson	457.9	Cotton Creek	O/C-Wet	High			2
Jefferson	461.8	Aggie Rd/Lower Neches River	HDD	High			1
Jefferson	462.5	Lower Neches River	HDD	High			1
Jefferson	469.9	Willow Marsh Bayou	HDD	High			1
Jefferson	473.8	Hillebrandt Bayou	HDD	High	Yes	0.3	1

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

County	Approximate Milepost	Waterbody Name	Proposed Crossing Technique	Relevant Surface Water or Fishery Class/Rating[b]	Potential Hydrostatic Test Water Source	Maximum Water Withdrawal (million gallons)[c]	Number of Crossings
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

Notes:
[a] Stream crossings within 0.5 mile upstream of fisheries habitat.
[b] Surface water classifications and associated fisheries classifications are described within the state-by-state sections.
[c] 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.
[d] 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 Drilling Method
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 warm water 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 proposed 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 relevant 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 2006). The perennial streams potentially crossed by the proposed 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 proposed Project would cross 18 perennial streams in Montana that support recreational or commercial fisheries (Table 3.7.2-1). Four of these perennial stream crossings, the Milk River (MP 82.9), the Missouri River (MP 89.3), and the Yellowstone River (perennial side channel at MP 196.1 and main channel at MP 196.4) would use the horizontal directional drilling (HDD) method (see Section 2.3.3.5 for a description of the HDD method). All other perennial stream crossings in Montana would use either the open-cut wet crossing method or an open-cut dry crossing method.

South Dakota

South Dakota classifies surface waters based on a waterbody's ability to support cold water and warm water fish presence and propagation (SDDENR 2008). Warm water classes are subdivided into permanent fish life propagation, semi permanent fish life propagation and marginal fish life propagation (SDDENR 2008). Eleven of the sixteen perennial fish streams crossed by the proposed Project in South Dakota are classified as supporting warm water fisheries. These include one permanent warm water fishery (Cheyenne River), three semi-permanent warm water fisheries (Little Missouri, South Fork Grand, and White rivers), and seven marginal warm water 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 proposed Project would cross 16 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 426.1), and the White River (MP 537.1) would be crossed using the HDD method. All other perennial stream crossings in South Dakota would use either the open-cut wet crossing method or an open-cut dry crossing method.

Nebraska

Nebraska classifies surface waters as supporting cold water and warm water 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 warm water 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 proposed Project would cross one cold water stream, Spring Creek (MP 604.2), that is rated as a Class B water. Cold water fish that may be maintained year-round by stocking in Spring Creek could include brook trout, brown trout, or rainbow trout. Of the 20 crossings of warm water streams 12 are rated Class A and 8 are rated Class B (Table 3.7.2-1). Common recreationally-important warm water 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 proposed Project would cross 21 perennial streams in Nebraska that support recreationally-important fisheries (Table 3.7.2-1). Four of these waterbodies would be crossed using the HDD method, including: the Niobrara River (MP 615.6), the Cedar River (MP 697.3), the Loup River (MP 740.7), and the Platte River (MP 756.3). All other perennial stream crossings in Nebraska would use either the open-cut wet crossing method or an open-cut dry crossing method. Two perennial fisheries streams would be crossed twice by the proposed pipeline corridor: an unnamed tributary to the South Branch Timber Creek and an unnamed tributary to the Platte River.

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 proposed Project. No perennial streams would be impacted by pump station construction.

3.7.2.3 Gulf Coast Segment and Houston Lateral

Perennial streams that would be crossed by the Gulf Coast Segment and the Houston Lateral of the proposed Project support warm water 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. Streams within the South Central Plain Ecoregion typically support diverse communities of indigenous or introduced fishes. Fish communities are dominated by sunfishes, darters and minnows and often contain numerous sensitive species.

Oklahoma

Oklahoma recognizes four types of fishery communities for fishery management purposes: Habitat Limited Aquatic Community, Warm Water Aquatic Community, Cool Water Aquatic Community, and Trout Fishery (OWRB 2009). Relative to these fishery communities, waters crossed by the pipeline corridor are classified as either Category 1 (adequate to support Warm Water Aquatic Communities) or Category 2 (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 warm water 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 51 perennial streams that support recreational or commercial fisheries (Table 3.7.2-1). Seven of these streams would be crossed using the HDD method, including: the Deep Fork River (MP 22.2), the North Canadian River (MP 38.6), the Little River (MP 70.4), the South Canadian River (MP 74.1), Fronterhouse Creek (MP 122.6), Clear Boggy Creek (MP 126.9), and the Red River (MP 155.7). All other perennial stream crossings in Oklahoma would use either the open-cut wet crossing method or an open-cut dry crossing method.

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 proposed Project in Texas are presented in Table 3.7.3-1; intermediate aquatic life use waters crossed by the proposed 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 99 perennial waters (including the Red River) that support recreational or commercial fisheries (Table 3.7.2-1). Seventeen of these perennial crossings would use the HDD crossing method (note: there is one additional HDD crossing in Texas for a waterbody that does not support recreational or commercial fisheries):

- Bois D'Arc Creek (MP 162.0);
- North Sulphur River (MP 190.8);
- South Sulphur River (MP 201.7);
- White Oak Creek (MP 212.8);
- Big Cypress Creek (MP 228.5);
- Private lake (MP 254.9);
- Big Sandy Creek (MP 256.9);
- Sabine River (MP 263.5);
- East Fork Angelina River (MP 311.9);
- Angelina River (MP 334.2);
- Neches River (MP 368.6);

- Menard Creek (MP 416.4);
- Pine Island Bayou (MP 449.0);
- Aggie Rd/Lower Neches River (MP 461.8);
- Lower Neches River (MP 462.5);
- Willow Marsh Bayou (MP 469.9); and
- Hillebrandt Bayou (MP 473.8).

Menard Creek would be crossed twice, at MP 404.1 and MP 416.4 using an open-cut and the HDD method, respectively. 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 method or the open-cut dry crossing method. Twenty-four other perennial fisheries streams along the proposed Gulf Coast Segment in Texas would be crossed multiple times.

The Houston Lateral Segment would cross three 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 the HDD method). 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

Potential impacts for fisheries resources associated with construction and operation of the pipeline system are addressed in this section. Impacts associated with potential spills of oil or other hazardous substances are addressed in Section 3.13. Section 3.6 discusses terrestrial wildlife resources, many of which use fish and aquatic invertebrates as a prey source. The potential proposed Project impacts to fisheries resources discussed in this section may have an indirect impact on wildlife that use aquatic animals as prey.

Disturbance to upland plant communities and soil could have indirect 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. Impacts to upland areas and measures to minimize erosion associated with disturbance of upland areas are discussed in Sections 3.3 and 3.5.

Some commenters on the draft EIS requested more information on avoidance, minimization and impact reduction measures that would be implemented to reduce proposed Project impacts to aquatic and fisheries resources. In response, Section 3.7.3 was supplemented with additional discussion of avoidance, minimization and impacts reduction measures.

3.7.3.1 Construction Impacts

The degree of construction-related impacts to fisheries resources within waterbodies that would be crossed by the proposed Project would depend on the crossing method, site-specific streambed conditions at each crossing, the duration of instream activity, and application of impact reduction measures. Crossing techniques for waterbodies would depend on stream size, the presence of sensitive resources, and protection status, classification of the waterbody and permit requirements (see Section 2.0 for construction method details). Waterbodies along the proposed Project route would be crossed using one of the following techniques:

- Non-Flowing Open-Cut Crossing Method;
- Flowing Open Cut-Crossing Method;
- Dry Flume Open-Cut Crossing Method;
- Dry Dam-and-Pump Open-Cut Crossing Method; and
- Horizontal Directional Drilling (HDD) Crossing Method.

Crossing methods for each waterbody potentially containing fishery resources are identified in Table 3.7.2-1. Perennial waterbodies containing aquatic species of concern that would be crossed using the HDD method have been identified. The need for aquatic surveys in those waterbodies where open-cut has been proposed to determine if these waterbodies support fish species of concern has been discussed with state and federal resource agencies. In accordance with the CMR Plan (Appendix B), site specific crossing plans would be developed for major waterbodies that contain recreationally or commercially important fisheries and would implement HDD at designated major and sensitive waterbody crossings where required. Site-specific crossing plans for HDD crossings have been developed (Appendix D) and site-specific open-cut crossing plans for major waterbodies would be developed (as described in Appendix B). Further, state fishery agencies would be consulted with and relevant USACE and USFWS permitting and consultation would be completed to determine specific open-cut crossing and construction methods to minimize proposed Project impacts to fishery resources.

To minimize potential proposed Project impacts to fisheries resources, the CMR Plan (Appendix B) would be implemented, which contains measures that would be used at and near waterbody crossings to reduce potential effects on fish and aquatic/streambank habitat. There would likely be a minor impact to aquatic organisms and their habitat if the proposed impact reduction procedures discussed below and in Section 3.7.3.3 are followed for the proposed Project waterbody crossings.

Non-Flowing 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).

The quantity, cover, and type of riparian bank vegetation vary depending upon site-specific waterbody conditions and locations. Removal of bank vegetation could lead 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. Revegetating riparian areas upon construction completion (as described in Section 4.5), limiting the extent of riparian vegetation loss (ROW width), and crossing intermittent or ephemeral streams when they are dry would minimize risks of increased water temperature. Trenching in the stream could cause a local increase in water temperature which could result in a temporary reduction in water quality and short-term impacts to fish and macroinvertebrates.

Open-cut methods could potentially increase the amount of sediment entering waterbodies during construction from bank and streambed erosion. The level of temporary elevated suspended sediment loading would depend upon the open-cut method selected and characteristics of the stream and adjacent uplands. Excessive suspended sediment 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 sediment could result in short-term impairment of foraging efficiency for species that are visual predators. Longer-term effects could occur if sediment covers eggs or young fish, causing increased mortality and reducing recruitment to the population (Newcomb and MacDonald 1991). To minimize the amount of sediment from stream bank and upland erosion entering waterbodies, the BMPs described in the CMR Plan (Appendix B) would be implemented, as well as any additional measures mandated within stream crossing permits issued by state and federal regulatory agencies. Measures specified in the CMR Plan (Appendix B) include:

- Installation of sediment barriers immediately after initial disturbance of waterbodies or adjacent uplands;
- Minimization of grading and grubbing along stream banks; and
- Prompt removal of plant debris or soil inadvertently deposited at or below the high water mark.

The implementation of these and other similar measures to reduce suspended sediment loads would result in proposed Project impacts to fisheries resources that would be short-term and temporary.

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). Whirling disease in salmonids is caused by a protozoan parasite (*Myxobolus cerebralis*) 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 proposed 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 proposed 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 proposed Project in the vicinity of reported occurrences.

To reduce the potential for transfer of aquatic pathogens, temporary vehicle bridges would be used to cross waterbodies to limit vehicle contact with surface waters and sediments. During open-cut pipeline installation, in-stream activities would be conducted outside of the waterbody channel as much as practical and would limit the use of equipment within waterbodies. Workspaces would be located at least 10 feet from waterbodies and would implement erosion control measures to reduce suspended sediment loading in waterbodies. These measures would also limit waterbody contact with vehicles and mud that could potentially serve as vectors for invasive species and whirling disease.

Flowing Open Cut Crossings

The typical flowing open cut crossing method allows the construction spread to move more quickly and reduces the amount of time the waterbody is subjected to construction disturbance. It is generally the preferred construction crossing method to reduce construction time and expense. However, it is not always practicable and construction of flowing open-cut crossings may result in additional short-term impacts including direct mortality to fishery and aquatic resources from direct in-stream trenching and backfilling. 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 et 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).

Some commenters on the draft EIS requested additional information regarding the length of time that elevated suspended sediment plumes and turbidity would occur due to flowing open-cut waterbody crossings. The length and extent of direct elevated suspended sediment plumes (and associated biological impacts) would depend upon the waterbody flow, disturbed sediment particle size, implementation of BMPs, type of installation activity, and duration of instream disturbance (Reid and Anderson 1998, Levesque and Dube 2007). Sediment deposition and elevated suspended sediment from open-cut trenching and backfilling have been shown to have effects on waterbody substrates and benthic invertebrate communities for various periods of time ranging from hours to years depending on site-specific conditions and installation activities (Levesque and Dube 2007). Typically, the sedimentation effects from instream trenching to aquatic biological resources are minor and elevated suspended sediment in the water column returns to typical levels within hours to days of instream disturbance (Levesque and Dube 2007). The highest rate of suspended sediment elevation (and associated potential impacts on aquatic resources) from open-cut installation typically occurs during instream trenching (Reid and Anderson 1998).

As described in the CMR Plan (Appendix B), instream trenching and backfill work periods would be carried out quickly (24 hours for minor, 48 hours for intermediate, and in accordance with site-specific plan for major waterbodies, as practical), to minimize the time period in which sediment would be suspended by construction activities. BMPs would be implemented, as described in the CMR Plan (Appendix B), to minimize sediment from stream bank and upland erosion entering waterbodies. Based on the implementation of the measures described in the CMR Plan (Appendix B) and additional measures mandated by state and federal permit agencies, elevated suspended sediment from proposed Project construction would be short-term and temporary. To minimize effects of suspended sediment on eggs and young fish, appropriate construction windows would be determined for each crossing. Potential longer term impacts after construction could include scouring of downstream areas or streambed disturbance if streambed modifications occur.

Dry Flume and Dry Dam-and-Pump Open-Cut Crossings

The dry flume or dry dam-and-pump open-cut methods would be used when crossing selected environmentally sensitive waterbodies. These methods 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. A pump that maintains 1.5 times the ambient flow rate at the time of construction would be utilized (CMR Plan, Appendix B). 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. The dam-and-pump open-cut 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 100 feet (minor and intermediate waterbodies) would be completed in less than 48 hours and potential impacts would be minor.

HDD Crossings

Successful HDD waterbody crossings would avoid direct disturbance to aquatic habitat, stream banks, and recreational or commercial fisheries and stream banks (AFS 2009, MTFWP 2009). Impacts could occur if there is an unintended release of drilling fluids (frac-out) during the HDD operation. A frac-out could release bentonitic drilling mud into the aquatic environment. The released drilling mud would readily disperse in flowing water or eventually settle in standing water. Although bentonite is non-toxic, suspended bentonite may produce short-term impacts to the respiration of fishes and aquatic invertebrates due to fouled gills. Longer-term effects could result if larval fish are covered and suffocate due to fouled gills and/or lack of oxygen. Egg masses of fish could be covered, thus inhibiting the flow of dissolved oxygen to the egg masses. Benthic invertebrates and the larval stages of pelagic organisms could also be covered and suffocate.

To minimize the potential for these impacts to occur as a result of a frac-out, a contingency plan would be implemented to address a HDD frac-out. This plan would include preventative and response measures to control the inadvertent release of drilling fluids. 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 impact reduction measures 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 or municipal sources. 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 operations, roadway and construction site dust control, and 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. Examples of recreationally or commercially-important fishes potentially occurring in waters proposed as sources for hydrostatic test-water include:

- Sauger at Boxelder Creek in Montana;
- Northern pike, smallmouth bass, walleye, and yellow perch in Frenchman Creek in Montana;
- Rainbow trout, brown trout, pallid sturgeon, shovelnose sturgeon, paddlefish, lake trout, northern pike, black bullhead, channel catfish, burbot, pumpkinseed, white crappie, yellow perch, sauger, and walleye in the Missouri River below the Fort Peck Dam in Montana;
- Bigmouth buffalo , black crappie , blue sucker, sunfish, cutthroat trout, brook trout, yellow perch, white crappie, white bass, walleye, tiger muskie, sturgeon chub, burbot, channel catfish, cisco, common carp, Chub, cutthroat trout, and freshwater drum in the Yellowstone River in Montana; and

- Bass, catfish, crappie, gar, sunfish, walleye, white bass, and yellow perch in the Red River in Oklahoma and Texas.

The volume of water required to test a 50-mile-long section of 36-inch-diameter 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, privately owned reservoirs, or municipal sources. Twenty-two 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. 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. Further withdrawal rates may be limited by conditions mandated by applicable permits. In some instances sufficient quantities of water may not be available from the permitted water sources at the time of testing. Alternate surface water sources would need approval from state regulators. 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.

To reduce the potential for the transfer of aquatic invasive species resulting from hydrostatic testing, hydrostatic test waters would not be discharged to watersheds outside of the withdrawal basins (i.e., no inter-basin transfers) and hydrostatic test water would be returned to the same water source within the same general vicinity. Withdrawal pumps would be equipped with 500 mesh (0.001 in, 0.025 mm, 25µ) screens capable of stopping macroinvertebrates. However, these screens would not eliminate the early larval stages of microinvertebrate, viral, bacterial, or parasitic pathogens. The use of mesh on hydrostatic testwater withdrawal pumps would prevent the entrainment of fish that are affected by whirling disease. Additional measures to minimize the potential spread of whirling disease, such as the use of equipment bridges to avoid construction equipment contact with instream waters and sediments during proposed Project construction, are presented within the previous flowing open cut crossing method discussion. In areas where zebra mussels are known to occur, all equipment used during the withdrawal and discharge of water prior to use at subsequent test locations would be thoroughly cleaned to prevent the transfer of this invasive species to new locations.

No chemicals would be used in hydrostatic testwater. 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. Energy dissipating devices and dewatering structures would be used to dissipate and remove sediment from hydrostatic testwater discharges. 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.

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 would be acquired prior to hydrostatic testing. Any water obtained or discharged would be consistent with permit notice requirements and with sufficient notice to make water sample arrangements prior to obtaining or discharging water. Water samples for analysis would be obtained 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.

During construction activities, there is also the potential for spills of fuel or other hazardous liquids. Impacts from fuel spills are assessed in Section 3.13.

3.7.3.2 Proposed Project Operational Impacts

During operation of the proposed Project, non-forested vegetation would be maintained along the permanent ROW. The reduction of trees in the permanent ROW could result in a permanent loss of shading, nutrients, and habitat enrichment features for fish at some waterbody crossings. Impacts associated with the permanent removal of riparian vegetation would be similar to those described in Section 3.7.3.1. A permanent ROW would not be maintained in those areas that would be crossed using the HDD method; therefore, no permanent riparian vegetation impacts are anticipated in these areas. Herbicides would be used to control vegetation within the permanent ROW during proposed Project operation. The use of herbicides near a waterbody could harm aquatic organisms, including fish. Herbicides could enter a waterbody through runoff, seepage through the soil, and direct introduction to water during application through overspray or wind drift. In accordance with the CMR Plan (Appendix B), no herbicides would be used within 100 feet of a wetland or waterbody and all herbicide application would be performed by a state-licensed pesticide applicator.

Restored stream banks may be vulnerable to erosion during the first few years after revegetation and stabilization, potentially leading to sediment entering waterbodies and impacting fisheries habitat. The restoration and revegetation measures presented in the CMR Plan (Appendix B) would be implemented to minimize soil erosion including in riparian areas.

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

3.7.3.3 Impact Reduction Procedures

To reduce the potential impacts to fisheries habitat caused by the removal of riparian cover, grading and grubbing of waterbody banks would be minimized. Grubbing would be for the most part limited to the pipeline trench and vehicle access areas. Extra workspace would be located at least 10 feet from waterbodies to minimize riparian disturbance. 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 plants; reclamation seed mixes would be determined through consultation with the local NRCS and relevant state and local agencies. In the event that a water body crossing is located within or adjacent to a wetland crossing, wetland crossing impact reduction measures would be implemented to the extent practicable.

During construction, significant impact reduction measures would include use of HDD to prevent direct disturbance to sensitive species habitat or larger river habitats and the associated fishery and aquatic species. For waterbodies that would be crossed using the open-cut method, agencies would be consulted, 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 (Appendix B) outlines stream channel restoration, bank restoration, and revegetation methods that would rehabilitate affected areas. Compliance with all state water quality regulations, USACE permitting, and USFWS consultations during construction would minimize 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.

Proposed impact reduction measures would result in the proposed Project having a low potential to adversely affect recreationally or commercially-important fisheries as a result of construction and normal operation. The combination 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 results in a low potential effect on fisheries resources from construction and normal operation. For affects associated with potential oil and hazardous substance releases, see Section 3.13.

3.7.3.4 Additional Mitigation Measures

Compliance with mitigation measures mandated in permit conditions by state and federal regulatory agencies would be in addition to the measures included in the CMR Plan (Appendix B) to protect fisheries resource. In Montana, compliance with fisheries and waterbody protection measures included in Appendix A, Appendix F, Appendix J, Appendix L, and Appendix P to the Environmental Specifications developed for the proposed Project by MDEQ would be required (see Appendix I). On federal lands in Montana and South Dakota, consistency with fisheries mitigation measures attached to the federal grant of ROW would be required. Also required would be compliance with conditions in South Dakota that were developed by the South Dakota Public Utility Commission (SDPUC) and attached to its Amended Final Decision and Order; Notice of Entry HP09-001.

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 proposed Project in Montana, South Dakota, Nebraska, Kansas, and Oklahoma (Tables 3.7.4-1). 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 1 to 25 for the states crossed by the proposed 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 Proposed Project

Waterbody Classification	Montana	South Dakota	Nebraska	Kansas	Oklahoma	Texas
Perennial	9	25	5	1	8	3
Intermittent	59	71	35	10	2	--
Total	*68*	*96*	*40*	*11*	*13*	*6*

In general, distribution line construction impacts to waterbodies and associated fisheries and aquatic habitat would be minor, as many lines would parallel 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 would ensure that the most feasible and least-impacting activities are performed at the site.

3.7.4.2 Big Bend 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 2.5.2, Western and BEPC have identified two alternative corridors ('A' and 'B') for the proposed Big Bend to Witten 230-kV transmission line project, and there are several route options within each corridor.

The number of perennial 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 similar to those described for the distribution lines discussed above; however, it is likely that the poles would be larger and that the stringing and staging areas disturbed around the pole installation sites would likely be larger.

TABLE 3.7.4-2
Number of Waterbody Crossings for Proposed Big Bend to Witten 230-kV Transmission Line Corridor A Alternatives for the Proposed 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 Big Bend to Witten 230-kV Transmission Line Corridor B Alternatives for the Proposed 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*

3.7.4.3 Bakken Marketlink and Cushing Marketlink Projects

Construction and operation of the Bakken Marketlink Project would include metering systems, three new storage tanks near Baker, Montana, and two new storage tanks within the boundaries of the proposed Cushing tank farm. Keystone reported that the property proposed for the Bakken Marketlink facilities near Pump Station 14 is currently used as pastureland and hayfields and that a survey of the property indicated that there were no waterbodies or wetlands on the property. DOS reviewed aerial photographs of the area and confirmed the current use of the land and that there are no waterbodies associated with the site. A site inspection by the DOS third-party contractor confirmed these findings. As a result, the potential impacts associated with expansion of the pump station site to include the Bakken Marketlink facilities would likely be similar to those described above for the proposed Project pump station and pipeline ROW in that area.

The Cushing Marketlink project would be located within the boundaries of the proposed Cushing tank farm of the Keystone XL Project and would include metering systems and two storage tanks. As a result, the impacts of construction and operation of the Cushing Marketlink Project on fisheries resources would be the same as potential impacts associated with construction and operation of the proposed Cushing tank farm described in this section.

Currently there is insufficient information to complete an environmental review of these projects. The permit applications for these projects would be reviewed and acted on by other agencies. Those agencies would conduct more detailed environmental review of the Marketlink projects. If these projects cross or disturb aquatic resources, the potential impacts to sensitive fisheries and aquatic habitat would be evaluated during the environmental reviews. Potential fisheries impacts would be evaluated and avoided, minimized, or mitigated, as appropriate, during state and federal consultation and permitting for the projects.

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