Appendix C: Cumulative Action Descriptions

This section presents descriptions of the cumulative actions that were identified in Section 3.1 of the main body of the EIS.

Missouri River Mainstem Reservoir System Construction:

The 1944 Flood Control Act (FCA) authorized the construction and operation of five large dams on the Missouri River mainstem. The projects authorized by the FCA, along with their reservoirs, are Garrison Dam (Lake Sakakawea) in North Dakota; and Oahe Dam (Lake Oahe), Big Bend Dam (Lake Sharpe), Fort Randall Dam (Lake Francis Case) and Gavins Point Dam (Lewis and Clark Lake) in South Dakota. The construction of Fort Peck Dam (Fort Peck Lake) in Montana was authorized in the Rivers and Harbors Act of 1935; however, the 1944 FCA incorporated the Fort Peck Dam along with the other five dams and reservoirs to form the System. Construction of the dams was completed in 1964. The impacts of reservoir system construction are reflected in the existing condition descriptions for each resource described in the affected environment and environmental consequences sections in Chapter 3.

Missouri River Recovery Management Plan Implementation:

The Missouri River Recovery Management Plan and EIS (Management Plan) and associated Science and Adaptive Management Plan (SAMP) were completed in 2018. The Management Plan and SAMP include a suite of actions and an adaptive management process intended to avoid jeopardy to the least tern, piping plover, and pallid sturgeon from operation and of the Missouri River Mainstem Reservoir System, operation and maintenance of the Missouri River Bank Stabilization and Navigation Project, and operation of the Kansas River Reservoir System. Several actions for pallid sturgeon are being undertaken in the upper Missouri River as part of the implementation of the Management Plan and SAMP. These actions include: propagation and augmentation of pallid sturgeon (hatchery production and stocking), population and assessment project (PSPAP) monitoring, and research and monitoring related to spawning cues, temperature manipulation, and drift dynamics.

Missouri River Water Depletions for Agricultural, Municipal and Industrial Use:

These actions include water withdrawals directly from the river channel and associated return flows (if any). Irrigation, agriculture, and municipal/industrial water use take place on the floodplain or adjacent uplands, supplied by pumping directly from the river. The effects of past and present water depletions are reflected for each resource in the affected environment and environmental consequences sections. Future water withdrawal projects in the project area that are reasonably foreseeable include:

- Dry-Redwater Rural Water System expansion – The objective of this system is to serve a population of about 15,000 people in a project area touching five counties in east-central Montana including towns and rural water users in the service area. The Proposed Alternative consists of a raw water intake and water treatment facility at North Rock Creek in the Big Dry Arm of Fort Peck Reservoir and over 1,200 miles of pipeline, 18 storage tanks, and about 50 pump stations. The proposed treatment facility is designed to meet a peak day demand of 3,750,000 gallons, an annual use of 985,630,000 gallons (3,025 acre-feet). Two extensions, the Sidney Circle Water System and Sidney South East Yellowstone Extension are withdrawing water. Two

more extensions, Sidney South and Circle extensions are projected to be built in coming years.

- Eastern North Dakota Alternate Water Supply Project (ENDAWS) – Garrison Diversion Conservancy District (Garrison Diversion), acting on behalf of the State of North Dakota, requested the Bureau of Reclamation to consider issuing a contract for up to 165 cubic feet per second (cfs) (approximately 119,000 acre-feet per year) of water from Garrison Diversion Unit (GDU) facilities as an alternate bulk water source for the Red River Valley Water Supply Project. Reclamation's' potential actions include construction of ENDAWS features, issuance of permits to construct and maintain ENDAWS facilities on Reclamation rights-of-way, issuance of a water repayment contract for GDU facilities, and compliance with the Boundary Waters Treaty of 1909. Reclamation signed a Record of Decision for this project in January of 2021.

Oil and Natural Gas Production

This action includes water withdrawals for use in hydraulic fracturing technologies for oil and gas wells. Return flows of treated wastewater from these activities is possible. Hydraulic fracturing is a key element in the development of natural "shale gas" fields, of which several are under development or forecast for development in the basin. Oil and Natural Gas Production also includes construction of infrastructure such as pipelines, roads, utilities, well pads, and staging areas. The 2011 EA and FONSI that accompanied the Garrison Dam/Lake Sakakawea Project, Surplus Water Report (USACE 2011) addressed the proposed action to allow the temporary use of up to 257,000 acre-feet of storage from the Garrison Dam/Lake Sakakawea Project for oil and gas development. Because of the relatively small magnitude of the predicted changes to discharges and water surface elevations the EA concludes that reservoir volumes would not be measurably impacted beyond existing conditions. This analysis was recently reaffirmed in the 2020 Programmatic Environmental Assessment to Implement the Requirements of the Oil and Gas Management Plan (USACE 2020)

Groundwater Withdrawal Practices

Alluvial aquifers are a common source of water for irrigation, municipal, industrial, household and livestock uses although irrigation accounts for most of the water used. This action includes groundwater pumping for a wide range of uses, from both shallow and deep aquifers, both along the floodplain of the mainstem and tributaries and across the uplands of the basin.

Urban, Residential, Commercial and Industrial Development:

This action includes a wide range of development that converts natural lands to a wide range of urban, residential, commercial, and industrial uses.

Crop Production:

This action includes the conversion of land from native habitat to crop production. Extensive acreage within the floodplain of the Missouri River and its tributaries, as well as the surrounding uplands, has been converted for crop production (National Research Council 2002).

Fishery Stocking and Management:

This action includes the stocking and management of native or non-native fish that can alter the natural fish composition in an area. This includes stocking of sport-fish in reservoirs. The primary hatchery for the project area is the Fort Peck State Fish Hatchery owned by the USACE and operated by MTFWP staff. The facility raises a variety of warm and cool water fish including walleye, northern pike, Chinook salmon, and rainbow trout. Garrison Dam NFH and Miles City SFH rear pallid sturgeon for stocking in the upper basin. Range-wide pallid sturgeon stocking plans were updated in 2019 including stocking strategies and targets.

Transportation and Utility Corridor Development:

This action includes the construction and maintenance of bridges, highways, local roads, railways and electrical and gas rights of way. There is a general trend in the region of increased traffic in response to the oil and gas boom which has led to needed roadway resurfacing and improvement options that would help maintain a consistent level of service.

State Fish and Wildlife Management:

Each state along the Mainstem Missouri River implements a comprehensive fish and wildlife habitat management plan (CWMP) that, at a programmatic level, serves to synthesize information on wildlife species, habitats, threats, conservation priorities and opportunities (Storms et al. 2008). The plans emphasize ecosystems and species of greatest conservation need. In the majority of states, the CWMPs represent an increased emphasis on conserving non-game species. The CWMPs also serve to identify priority conservation areas; each mainstem state identifies portions of the Missouri River as a high priority for conservation.

Management of USACE Project Properties:

Missouri River project lands managed by the USACE represent a significant amount of designated fish and wildlife habitat in the study area. Project lands are divided into land classifications that govern the land uses, management activities, and level of development that are allowed. The Environmentally Sensitive, Wildlife Management, and Vegetation Management classifications are managed predominantly for fish and wildlife habitat.

USFWS National Wildlife Refuge System Land Management:

The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats. Seven national wildlife refuges are located along the mainstem Missouri River encompassing a total of 1,192,891 acres:

- Charles M. Russell NWR in north-central Montana;
- Audubon NWR in central North Dakota;
- Karl E. Mundt NWR in southeastern South Dakota;
- Desoto NWR and Boyer NWR on the Iowa/Nebraska border;
- Squaw Creek NWR in northwestern Missouri; and,
- Big Muddy NWR, which consists of several land units in the Missouri River floodplain between Kansas City and St. Louis, Missouri.

Tribal Programs and Actions:

The Tribes along the Missouri River are involved with natural resources management and several tribes are involved with the management of federally listed species. As an example, the Cheyenne River Sioux Tribe is involved with the management of federally listed species through their involvement d plovers on the Missouri and Cheyenne Rivers (USFWS 2000). In the project area, the Three Affiliated Tribe's Fish and Wildlife Division and The Fort Peck Tribe's Fish and

Game department manage their Reservation's wildlife by regulating hunting and fishing activities.

Yellowstone Intake Diversion Dam Modification:

The goal of the Yellowstone Intake Diversion Dam modification is to improve passage for the endangered pallid sturgeon and other native fish in the channel of the Lower Yellowstone River. The proposed federal action will modify Intake Diversion Dam and main canal headworks to improve passage for endangered pallid sturgeon and other native fish in the lower Yellowstone River and reduce entrainment of fish into the Lower Yellowstone Project main canal while still delivering the full water right to the Lower Yellowstone Project.

Water Quality Management Programs:

Ongoing water quality management programs, such as those administered under the Clean Water Act, aimed at maintaining or improving the quality of water in the project area would continue. The state of Montana has established water quality standards to help protect and maintain water quality necessary to meet and maintain designated or assigned uses such as swimming, recreation, public water supply, and aquatic life. The Fort Peck Assiniboine and Sioux Tribes have established water quality standards for the Fort Peck Indian Reservation.

Climate Change:

USACE Climate Change guidance and most references from other sources for the Missouri River basin agree that future climate trends will likely consist of increased temperatures and precipitation . Increased precipitation will result in higher streamflow, while increased temperatures will likely result in earlier spring snowmelt, decreased snowmelt season duration, and decreased peak snowmelt flows. Increased air temperatures could also have impacts on water temperatures and water quality. Rainfall events will likely become even more sporadic for the entire Missouri River basin. Large rain events will likely become more frequent and interspersed by longer relatively dry periods. Extremes in climate will likely also magnify periods of wet or dry weather, resulting in longer, more severe droughts, and larger more extensive flooding. A more-detailed description of possible climate change impacts to Missouri River hydrology is presented in the Hydrogeomophology section (Section 3.2).