

Environmental Consequences

4.1 INTRODUCTION

4.1.1 Summary of Proposed Action and Alternatives Evaluated in Detail

This Chapter presents the environmental and socioeconomic consequences of implementing the Proposed Action and alternatives described in Chapter 2 and summarized below.

- Proposed Action – Permit applications for commercial sand and gravel dredging would be approved at the levels requested by the eight companies within the reaches of the river specified in the applications. Permitted dredging from the LOMR would equal or exceed recent demand levels; therefore, no increased utilization of alternate supplies would likely be necessary.
- No Action Alternative – Permit applications for commercial sand and gravel dredging would not be approved; commercial dredging of sand and gravel in the LOMR would cease on December 31, 2010. Alternate sources of commercial sand and gravel would be relied on to fulfill demand.
- Alternative A – Allowable commercial dredging tonnages would be set at levels at the lower end of the range that is reasonably expected to reduce the contribution of sand and gravel dredging to continued river bed degradation. Alternate sources of commercial sand and gravel would fulfill the remaining demand.
- Alternative B – Allowable commercial dredging tonnages would be set at levels at the upper end of the range that is reasonably expected to reduce the contribution of sand and gravel dredging to river bed degradation. Alternate sources of commercial sand and gravel would fulfill the remaining demand.
- Alternative C – Allowable commercial dredging tonnages would be set at levels that approximate recent dredging. Permitted dredging from the LOMR would equal or exceed recent demand levels; therefore, no increased utilization of alternate supplies would likely be necessary.

Each alternative is defined in terms of annual tonnage, dredging location, restrictions to dredging, operational conditions, and monitoring requirements, as described in Section 2.4.

4.1.2 Environmental Resources Evaluated

This environmental consequences chapter addresses the following resource areas and topics:

- Geology and Geomorphology
- Infrastructure
- Navigation and Transportation
- Water Resources
- Aquatic Resources
- Wetlands, Floodplains, and Terrestrial Resources
- Federally Listed Species
- Land Use and Recreation
- Economics and Demographics
- Noise
- Visual and Aesthetic Resources
- Cultural Resources
- Air Quality and Climate Change
- Cumulative Impacts

The following sections include a description of the approach and methods used in the analysis and a discussion of potential impacts by alternative, impact issue, and river segment.

4.1.3 Key Assumptions

Commercial dredging of sand and gravel was previously authorized to continue in the LOMR through December 31, 2010. Commercial dredging is conducted under a specific set of permit conditions previously developed to reduce the impacts of dredging on the river and related environmental resources. Defined below are assumptions used in the analysis of environmental consequences that reflect these important points.

4.1.3.1 Baseline Conditions

The environmental and socioeconomic impacts associated with implementation of the Proposed Action and each alternative were evaluated relative to baseline conditions. Baseline conditions, described in Chapter 3 (Affected Environment) reflect the existing environment of the LOMR, which includes the

direct and indirect impacts of dredging and other Missouri River projects to date. The direct and indirect impacts of the Proposed Action and each alternative were estimated or characterized as a change from baseline conditions. Adverse and beneficial impacts to a particular environmental resource (e.g., aquatic resources) were identified based on the direct impacts of dredging and indirect effects that are generally manifested through changes in the river channel geometry and water elevations, as compared to the baseline. Indirect impacts were based largely on the projected changes in the river channel based on the results of the geomorphic analysis.

Under the No Action Alternative, commercial dredging of sand and gravel in the LOMR would cease, as would the direct impacts associated with dredging operations (e.g., dredge and barge trips, removal of sand and gravel, noise, and air pollutant emissions). The indirect impacts of the No Action Alternative would be determined by the geomorphic response of the river to the change in sediment regime (e.g., greater sediment load and supply) within each river segment, and the corresponding effects on each of the environmental and socioeconomic resources. The Proposed Action represents a considerable increase in dredging, and Alternatives A and B represent a decrease in dredging compared to recent levels. Direct impacts associated with dredging were assessed based on the magnitude of dredging operations under the Proposed Action and the action alternatives; indirect impacts were assessed based on the projected changes in the river channel indicated by the geomorphic analysis.

Under Alternative C, dredging would approximate recent levels. The response of the river would generally follow its current trajectory, and ongoing impacts to resources would generally continue.

With respect to socioeconomics, it was assumed that baseline conditions include the socioeconomic effects of recent dredging activity on the regional economy, tax revenues, royalties, and the cost of sand and gravel. Potential socioeconomic impacts may include complex responses that are not immediately intuitive. For example, changes in economic activity caused by changes in the amount of river dredging can be offset by other changes in response, such as increases in the trucking industry.

4.1.3.2 Implementation of Current Permit Conditions

It is important to note that commercial dredging of sand and gravel authorized to continue through December 31, 2010, was previously permitted with a specific set of conditions that were imposed to reduce the environmental consequences associated with dredging activities. These conditions are presented in Section 2.4. The environmental consequences discussion assumes that these permit conditions would apply to the Proposed Action and action alternatives. Any potential new permit

conditions are discussed in Chapter 6, “Avoidance, Minimization, and Mitigation Actions,” with other potential mitigation actions. Furthermore, it was assumed that permitting agencies would continue to exercise their regulatory authority to develop and enforce site-specific permit conditions in order to ensure that federal, state, and local regulations are not violated and significant concerns of local residents are addressed. Examples include CWA Section 401 water quality certifications, NPDES discharge permits, MDNR sand and gravel mining permits, other mining permits, and local land use and zoning regulations. See Chapter 7 (Environmental Statutes, Executive Orders, and Governing Agencies) for more information.

4.1.3.3 Alternate Sources

As discussed in Chapter 2, it was assumed that reductions in river dredging below recent levels of demand for commercial sand and gravel would require the use of alternate sources—land- and river-based sources of aggregate and sand, and dredging in other rivers—to meet regional demand. This increase in land-based production and shifting production to other rivers would generate induced secondary environmental and socioeconomic impacts. However, the specific location, timing, and magnitude of these impacts are not reasonably foreseeable because they would result from land use, environmental, business, and regulatory factors that cannot be predicted. Therefore, the impact analysis for alternate sources is general and based on existing information about the most probable types and locations of sand and gravel sources (e.g., open-pit mines, instream mining, and dredging in other rivers).