

BLM Study Review of Hells Canyon Complex Studies

Shoreline Erosion in Hells Canyon

Technical Report, Appendix E.3.2-42

**Craig A. Johnson, Fisheries Biologist (Area Biologist)
Cottonwood Field Office
Cottonwood, Idaho**

November 14, 2002

1. INTRODUCTION

From 1998 through 2001, Idaho Power Company ecologists investigated shoreline erosion along the Snake River in Hells Canyon, from Weiser, Idaho, downstream to the confluence with the Salmon River. The objectives of the study were to (1) conduct a literature review of erosion, erodability of soils, and the potential for mass movement of shoreline soils in the study area; (2) conduct a literature review to gather information of the factors that cause shoreline erosion in the study area; (3) inventory shoreline erosion in the study area; (4) assess and summarize the factors that affect shoreline erosion in the study area; and (5) develop a geographic information system (GIS) coverage of shoreline erosion for the study area.

2. CONCLUSIONS

Based on studies of environments similar to Hells Canyon, the principal factors affecting shoreline erosion in the canyon were climate, upland ground cover, soil type, topography, riparian vegetation, groundwater seepage, floods, wind-driven waves, boat-generated waves, hydroelectric operations, livestock, roads, and recreation.

Approximately 432 miles of shoreline were inventoried in the study area. For analysis and discussion purposes, the study area was divided into five reaches. The upstream unimpounded Weiser Reach has relatively large amounts of bank erosion (12% of shoreline). The Brownlee Reservoir Reach had the highest rate of bank erosion (43.7% of shoreline). The Oxbow Reservoir Reach had relatively little bank erosion (3.3% of shoreline). The Hells Canyon Reservoir Reach had relatively little bank erosion (4.3% of shoreline). The reach below Hells Canyon Dam had relatively little bank erosion (3.1% of shoreline).

Management actions would be best directed at controlling those human-caused factors that trigger erosion on shoreline banks. These actions should focus on minimizing water-level fluctuations, controlling recreation influences (e.g., boat-driven waves, camping, trails, and vehicle access), minimizing the effects of roads and other construction and maintenance activities, and reducing livestock grazing effects. Because streambank erosion is a natural geomorphic process, the challenge is to minimize excessive rates of erosion in Hells Canyon.

3. STUDY ADEQUACY

The study is complete and meets intended research parameters. This study will address many of the potential questions that may arise from project impacts and development of Protection, Maintenance, and Enhancement measures.

4. BLM CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Based on this study and other studies of environments similar to Hells Canyon, it is concluded that the principal factors affecting shoreline erosion in the canyon were climate, upland ground cover, soil type, topography, riparian vegetation, groundwater seepage, floods, wind-driven waves, boat-generated waves, hydroelectric operations, livestock, roads, and recreation. However quantifiable data is not provided. This is needed to assess project impacts.

RECOMMENDATIONS

As identified in the study, erosion is random, an objective pattern of erosion in a particular reach may not emerge without many years of observations and documentation. It is recommended that long term shoreline erosion research and monitoring be conducted in “key” areas within the five reach segments that this study assessed.