

number and size of gravel bars are significantly different from what is evident in historical photos, for example, the difference might be an indication that either aggradation or erosion has been enhanced. Care is needed when using the channel to interpret possible changes in watershed conditions since similar channel symptoms can also be caused by changes in conditions within the stream corridor itself or by natural variation of the hydrograph.

Stream Corridor and Reach Factors Affecting Stream Corridor Conditions

In addition to watershed factors affecting stream corridor conditions, it is important to consider disturbances at the stream corridor and reach scales. In general, stream corridor structural attributes and functions are greatly affected by several important categories of activities if they occur within the corridor. Chapter 3 explores these in more detail; the following are some of the activities that commonly impact corridor structure and function.

- Activities that alter or remove streambank and riparian vegetation (e.g., grazing, agriculture, logging, and urbanization), resulting in changes in the stability of streambanks, runoff and transport of contaminants, water quality, or habitat characteristics of riparian zones (**Figure 4.14**).
- Activities that physically alter the morphology of channels, banks, and riparian zones, resulting in effects such as the displacement of aquatic and riparian habitat and the disruption of the flow of energy and materials (e.g., channelization, levee construction, gravel mining, and access trails).
- Instream modifications that alter channel shape and dimensions, flow



Figure 4.13: Water releases below a dam. Altering the flow regime of river below Hoover Dam altered the stream condition.

hydraulics, sediment-transport characteristics, aquatic habitat, and water quality (e.g., dams and grade stabilization measures, bank riprap, logs, bridge piers, and habitat “enhancement” measures) (**Figure 4.15**). In the case of logs, it might be the loss of such structures rather than their addition that alters flow hydraulics and channel structure.

Altered riparian vegetation and physical modification of channels and floodplains are primary causes of impaired stream corridor structure and functions because their effects are both profound and direct. Addressing the causes of these changes might offer the best, most feasible opportunities for restoring stream corridors. However, the altered vegetation and physical modifications also may create some of the most significant challenges for stream corridor restoration by constraining the number or type of possible solutions.

It is important to remember that there are no simple analytical methods available for analyzing relationships



Preview Chapters 7 and 8, Analytical and Empirical Tools section.