

Natural and Beneficial Functions of the Floodplain

Surface waters, their floodplains, and their watersheds must be viewed as parts of one ecological system. This system exists in a state of dynamic equilibrium. If one of the parts of the system is disturbed, the entire system will readjust toward a new equilibrium. This is true of coastal, river, and lake systems. The geological and biological effects of the system's readjustments toward its new equilibrium are often felt far from the original site of the disturbance and can last for decades. For this reason, if for no other, floodplain development and modification should be viewed with caution and with careful assessment of the potential adverse impacts on natural values.

Floodplains in their natural or relatively undisturbed state provide three broad sets of natural and beneficial resources and hence resource values:

1. Water resources values including natural moderation of floods, water quality maintenance, and groundwater recharge.
2. Living resources values including large and diverse populations of plants, and animals.
3. Cultural resource values including historical archeological, scientific, recreational, and esthetic sites in addition to sites generally highly productive for agriculture, aquaculture, and forestry where these uses are compatible with natural values.

WATER RESOURCES VALUES

Natural Flood Storage and Conveyance.

The characteristics of the floodplain and of flooding are closely interdependent. Floods shape floodplain topography and soils and influence ecology. In turn, the physical characteristics of the floodplains shape flood flows. Except in narrow, steep valleys and areas of coastal bluffs, floodplains provide a broad area to spread out and temporarily store flood waters. This reduces flood peaks and velocities, and the potential for erosion. In their natural vegetated state, floodplains slow the rate at which incoming overland flow reaches the main water body. They also accommodate the natural phenomena of stream meander and beach drifting.

Water Quality Maintenance

Floodplains serve important function in protecting the physical, biological, and chemical integrity of water. Water that runs off quickly over the surface, as on a barren floodplain, is capable of carrying with it large amounts of sediment and debris to the main water body. A vegetated floodplain, however, slows the surface runoff, causing it to drop most of its sediment load on the floodplain. Vegetation also filters incoming flood waters. Much of the sediment origination on the land drops out as well as some of the scoured from the channel bank and bed. This filtering process may add rich nutrients to the floodplain soil. However, excess nutrients entering the stream in runoff can accelerate eutrophication in downstream lakes and reservoirs.

Groundwater Recharge

The natural floodplain has surface conditions favoring local ponding and flood detention, plus subsurface conditions favoring infiltration and storage. The slowing of runoff across the floodplain allows additional time for the runoff to infiltrate and recharge available groundwater aquifers, when there is unused storage capacity. The slowing of runoff provides the additional absorption, and aerobic and anaerobic biological action. This value extends into nonflood periods as

groundwater discharge acts to naturally regulate the flow in a river or the level of a pond. In other words, during periods of abundant water, the water can enter the groundwater system whenever there is available capacity rather than contribute to seasonal flood peaks; during low flow periods, the water flows from higher ground-water system into lower surfaces waters, so that the frequency and duration of extremely low flows is reduced.

LIVING RESOURCES AND HABITAT VALUES

The Nation's coastal and riverine floodplains support large and diverse populations of plants and animals. In addition they provide habitat and critical sources of energy and nutrients for organisms in adjacent and downstream terrestrial and aquatic ecosystems. The wide variety of plants and animals supported directly and indirectly by floodplains constitutes an extremely valuable, renewable resource important to economic welfare, enjoyment, and physical well being.

The floodplain is biologically important because it is the place where land and water meet and the elements of both terrestrial and aquatic ecosystems mix. The detritus provided by headwater woodlands frequently provides the major source of nutrients and energy that sustain production in woodland streams. Nutrients and energy that enter these upstream areas find their way far downstream into larger rivers and lake via the aquatic food chain. Shading of the stream by floodplain vegetation moderates water temperatures; roots and fallen trees provide in stream habitat, and near stream vegetation filters runoff, removing harmful sediments and buffering pollutants, to further enhance in stream environments.

CULTURAL RESOURCES VALUES

Floodplains contain cultural resources important to the Nation and to individual localities. Native American settlements and early cities located along the coasts and rivers in order to have access to water supply, waste disposal, water transportation, and transshipment. Consequently, floodplains include most of the Nation's earliest archeological and historical sites. In addition to their historical richness, floodplains may contain invaluable resources for scientific research. For example, where floodplains contain unique ecological habitats, they make excellent areas for scientific study. The bedrock geology of the area may be exposed in the floodplain. Floodplains may provide open space community resources. In urban communities they may provide green belt areas to break urban development monotony, absorb noise, clean the air, and lower temperatures. Floodplain parks can also serve as nature study centers and laboratories for outdoor learning experiences.

Because of their scenic value and locational and other characteristics, some of which are unique, floodplains are attractive for recreation. Water-oriented sports, boating, and swimming can be based in a natural floodplain park which also may be suitable for hiking and camping. Floodplain wildlife resources can be managed for observation as well as for recreational hunting and fishing. Finally natural floodplains are valued as constituents of the "wilderness experience" important in the American culture.