Costs and Benefits of River Restoration

Restoration of biological and physical ecosystem functions in the floodplain of the Willamette River can generate economic costs, benefits, or both for owners of the land where restoration occurs, owners of other lands, and the overall economy.

The potential costs can materialize in several ways (Table 50). Besides the labor and other costs associated with restoration projects, there may be costs associated with on-site and other lands. If restoration would curtail the production of goods or services from a parcel of land, then the cost would be the forgone net revenues. If it would reduce a parcel's attractiveness for use as a homesite, then the cost would be the reduction in the value of the land and associated structures, driveways, and other improvements. If restoration would reduce the ability of public lands to provide services, the cost would be the additional expense of securing replacement services. These land-related costs might materialize, for example, if restoration involving reestablishment of the river's access to multiple historic channels occasionally resulted in increased flooding of nearby parcels, reducing the net revenues from farm production, the market price of a riverbank home, or the utility of a public roadway.

A final category of costs would occur if restoration reduced the aesthetic, recreational, or related values of the river and its riparian zones. These costs might arise, for example, if the reestablishment of riparian forest blocked an attractive view of the river or if reestablishment of multiple channels made fishing and boating more difficult.

The potential economic benefits from riparian restoration are equally diverse. In general, the primary intended benefit would come from a boost to populations of desirable species, such as salmon, and a reduction in populations of undesired ones, such as exotic weeds. Restorative efforts that reconnect the river with its historic floodplain would increase the land's ability to store flood water, thereby potentially reducing the downstream risk of flood damage. A net benefit would materialize if the avoided damage downstream—especially on high-value, urbanized lands—outweighed the increased damage from flooding of an upstream floodplain with agricultural or other lands with a lower value.

Restoration efforts resulting in improved water quality downstream would provide benefits to municipal-industrial water users, recreationists, and those concerned about the impacts of poor water quality on fish and wildlife. Improvements in quality could arise because restoration slowed the flow of pollutants into the river or stimulated natural processes that remove pollutants from the river.

In some cases, restoration might increase the net revenues water users derive from agricultural, commercial, or industrial uses. Reconnecting the river to multiple channels, for example, might reduce the river's erosional power and, hence, the costs owners of riverbank properties incur to resist this power. If significant improvement in the aesthetic or recreational attractiveness of the river were to result from restoration, it could raise the values of nearby residential properties, or increase the revenues for nearby restaurants and similar types of commercial enterprises.

The Data

Standard economic reasoning indicates that, all else equal, restorative efforts generally should be targeted toward lands where the net economic benefits (gross benefits minus gross costs) for society as a whole would be greatest. Currently, however, the available data are insufficient to support a determination of the net benefits of alternative restoration strategies. Nonetheless, the current data offer insights into the patterns by which some of the potential costs and benefits vary along the floodplain.

Data from county assessors (data for Yamhill County were not accessible) on each parcel of land, called a taxlot, show the existence of patterns in land uses that might be impeded by restoration efforts. Information from the 1990 land use/land cover data (pp. 78-81) reveals patterns in the incidence of crops county extension agents in the Willamette Valley consider most resistant to flooding.

Assumptions

As a first approximation, the higher the value of the land, the greater the expected land costs associated with restoration. The lowest land costs are associated with lands with assessed values less than $2,500 per acre, for they typically are classified for agricultural use and have little potential for residential or urban development in the foreseeable future. The greater the incidence of improvements, such as buildings and roads, the greater the potential land costs if restoration were to interfere with ongoing land uses, but the greater the benefits if restoration were to enhance these uses or reduce flood risks. The greater the incidence of agricultural lands with flood-resistant crops or other vegetation, the lower the expected land costs associated with restoration efforts that would increase temporary flooding.

Patterns

Outside the cities, the incidence of taxlots whose land has assessed values less than $2,500 per acre generally exceeds 20% and often exceeds 50% (Fig. 201). The pattern of land improvements is less distinctive. Nearly all taxlots in the cities have improvements, but so too do many taxlots outside the cities (Fig. 202). Flood-resistant crops (e.g., orchards, sugar beets, and radish seeds) occur most frequently at the mouth of the Willamette River, downstream of Salem, near the confluence of the Santiam and Willamette Rivers, and around Harrisburg (Fig. 203).

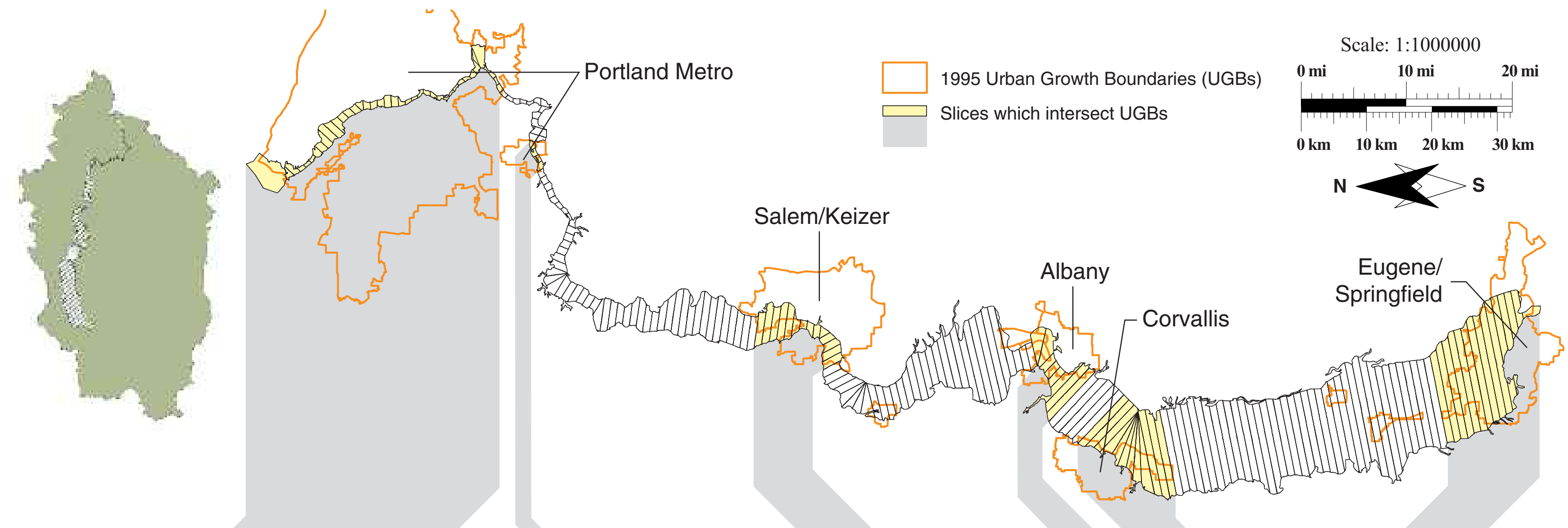
Potential for Restoration

Restoration will generate economic benefits as well as costs. These may materialize in the same place, but often the costs will be concentrated in one place and the benefits will materialize on nearby properties, far downstream, or for the economy as a whole. Programs to compensate those initially bearing the costs could leave them economically whole and spread the costs so that those who receive the benefits ultimately bear the costs. Contemporary programs and institutions are not necessarily well organized to accomplish this.

The widespread occurrence of land with low assessed values indicates there may be opportunities throughout the valley, outside the cities, for holding down the on-site land costs of restoration projects. More detailed analysis is needed to determine how the distribution of existing land improvements might affect the network-scale spatial design of a restoration strategy. The pattern of flood-resistant crops shows where landowners already are responding to higher, localized flood risks, and their strategies for coping with floods may provide useful information about the potential consequences of restoration efforts that would increase local flooding elsewhere.

Primary Potential Restoration Costs	Primary Potential Restoration Benefits
• Labor, etc. to design, implement, and maintain restoration projects. • Forgone net revenues when restoration curtails an agricultural, residential, commercial, or industrial land use. • Reduced land values when restoration diminishes the attractiveness of residential land use. • Decreased aesthetic value, recreational opportunities, and other amenities the river and riparian areas provide consumers. • Diminished services, or increased costs of providing services, from public lands.	• Increased ecological function, such as greater production of desirable fish and wildlife. • Reduced risk of flood damage downstream. • Improved water quality downstream. • Increased net revenues when restoration enhances agricultural, commercial, or industrial land use. • Increased land values when restoration increases the attractiveness of residential land use. • Increased aesthetic value, recreational opportunities, and other amenities the river and riparian areas provide. • Enhanced services, or diminished costs of providing services, from public lands.

Table 50. *The primary potential costs and benefits of restoration of biological and physical functions in the historical floodplain of the Willamette River.*



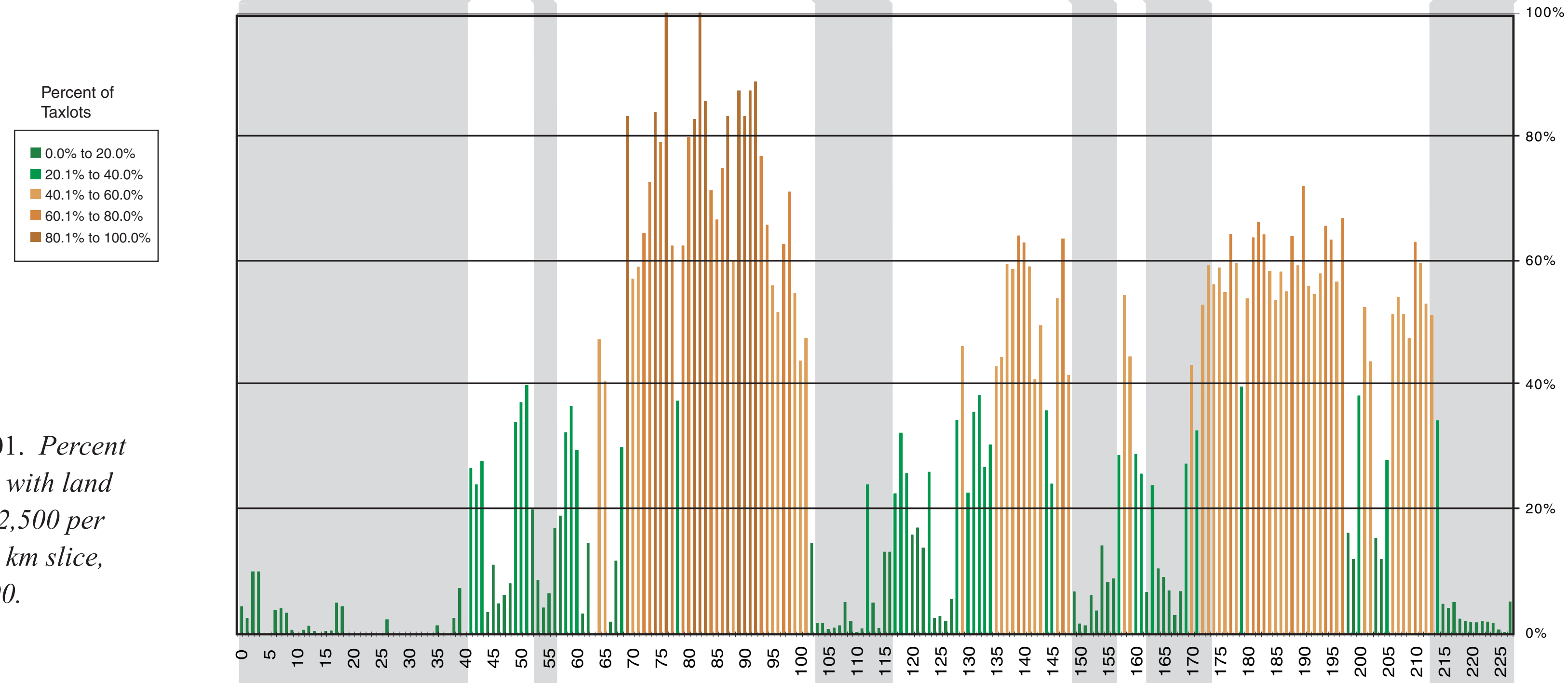


Figure 201. *Percent of taxlots with land value < $2,500 per acre by 1 km slice, circa 1990.*

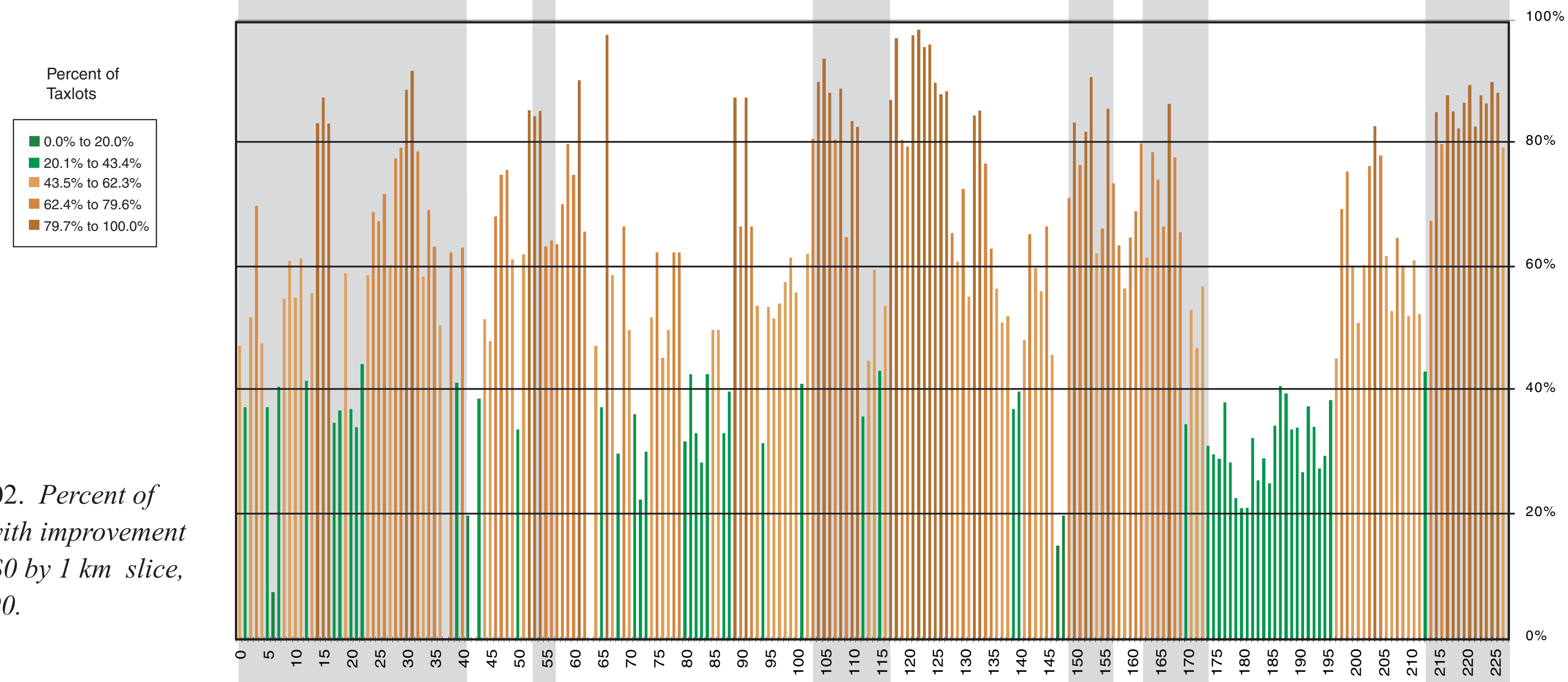


Figure 202. *Percent of taxlots with improvement value > $0 by 1 km slice, circa 1990.*

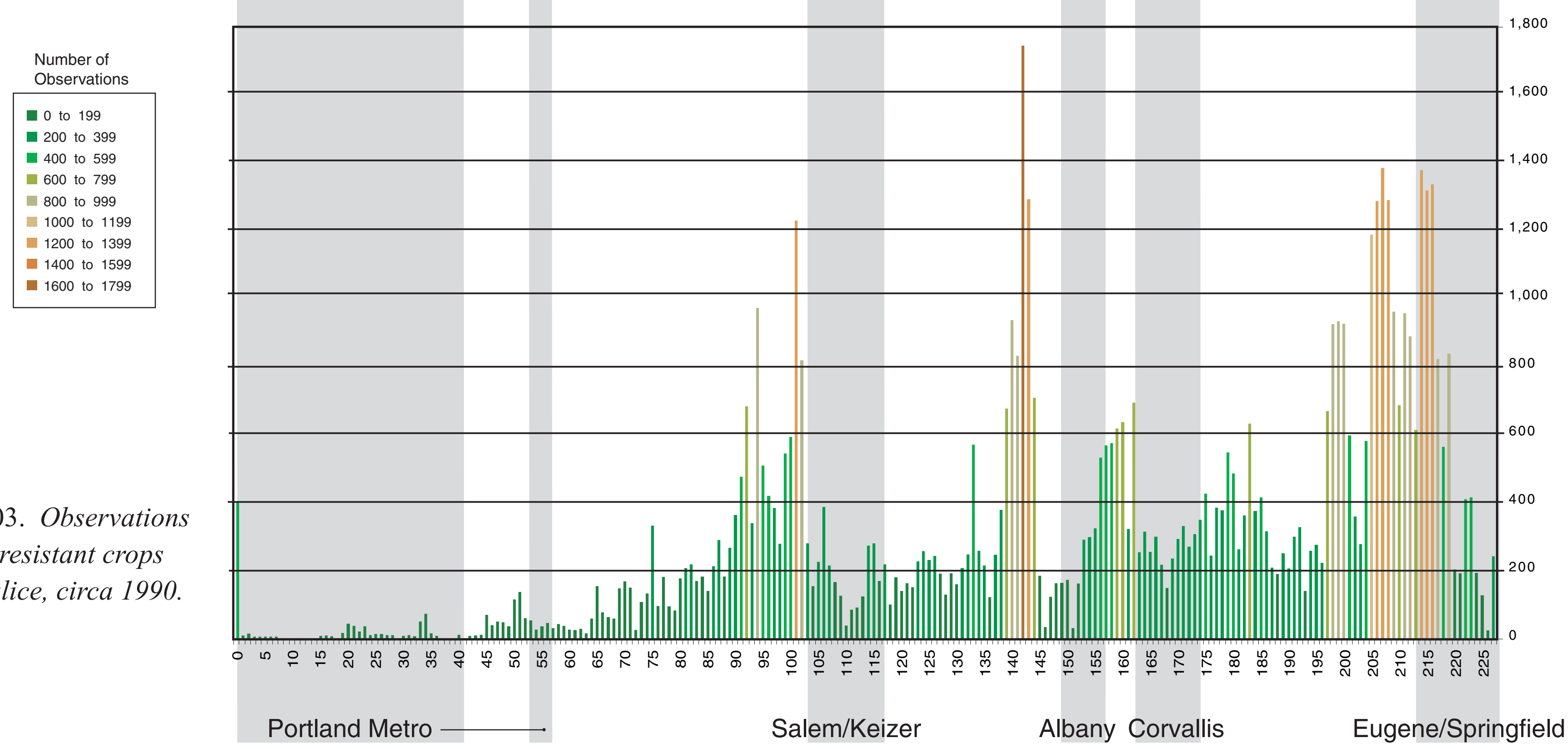


Figure 203. *Observations of flood-resistant crops by 1 km slice, circa 1990.*

Note: *1 hectare equals 2.47 acres*