CHAPTER 7: PARKWAY VISION PLAN

Overview

Design concepts for a Vision Plan for the Lower Ventura River Parkway begin with a look at the entire six-mile proposed parkway corridor.

The material presented in this Chapter consists of a summary plan view (figure 7.1) followed by individual elements with features to address objectives related to hydrology, ecosystems, and culture. In addition, there is an introduction to the locations of more detailed design concepts presented in later chapters.

A vision plan is not a blueprint. A plan for a parkway for the Lower Ventura River will be developed by citizens of the Ventura River Watershed after they have become committed to the parkway, and after they have engaged in a long process of discussion about the way in which they want the river to be a part of their children's lives.

A vision plan has a broad brush. It is a big-picture look at ideas that will be useful to those future discussions. More than anything, it is an attempt to present the idea of a parkway on the river as something that could really exist someday.

PARKWAY VISION PLAN

Summary

Land Uses

- Ventura River floodway
- Expanded floodway
- Open Space — Riparian
- Open Space — Oak Woodland
- Floodplain farming
- Estuary/wetlands expansion
- Tributary restoration with riparian buffer

Circulation

- Freeways/Highways
- Major Roads
- Trails — Multiple Use (Bike/Walking
- Trails — Walking
- Trails — Ephemeral
- Cross-river bridges (vehicular/pedestrian)
- Pedestrian bridges

Sites (Chapters 9-12)

1. Foster Park
2. Cañada Confluence
3. Cottonwood Junction
4. Downtown Delta

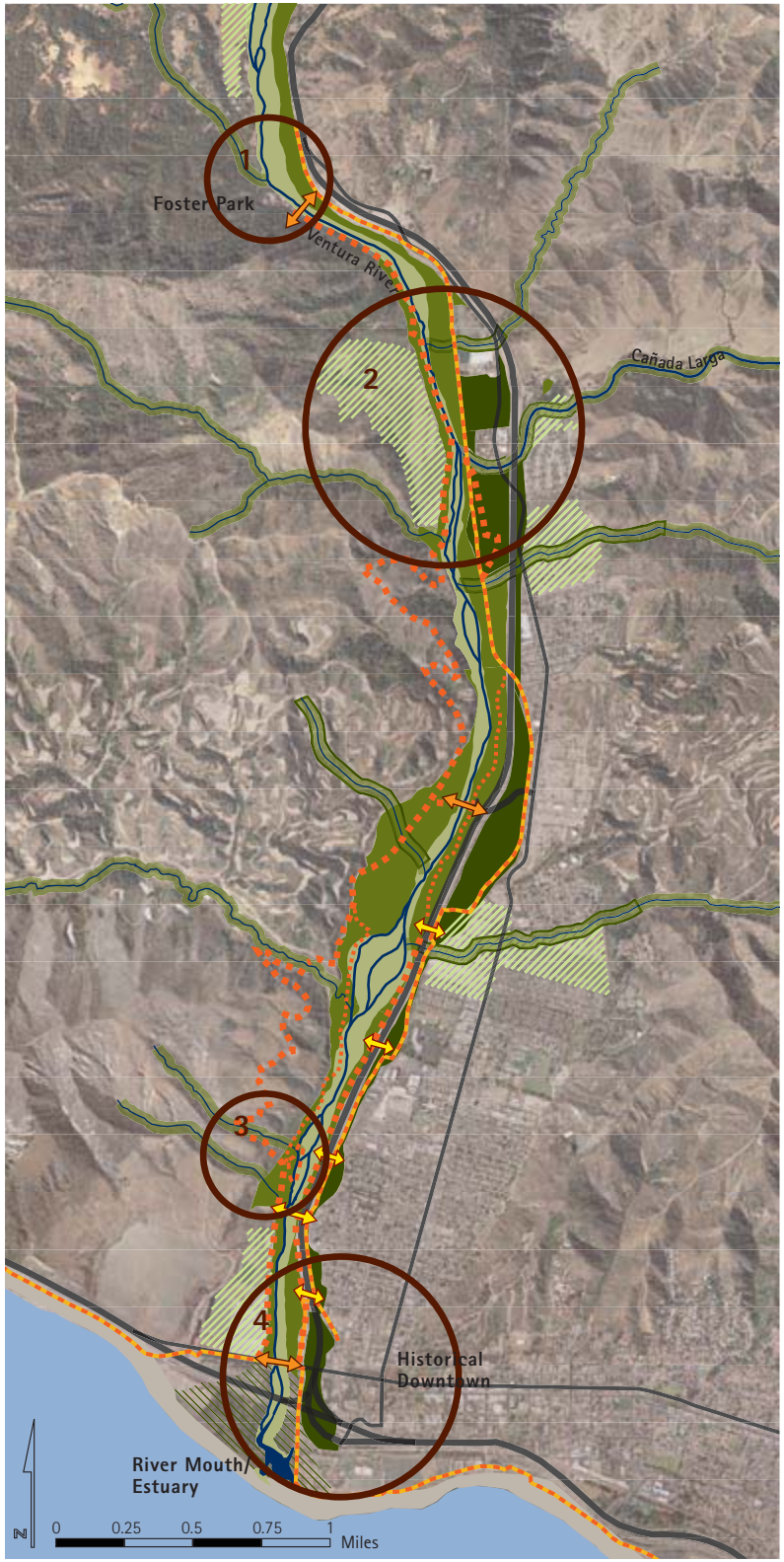


FIGURE 7.1 *Parkway Vision Plan Summary.*

Hydrology Element

Key objectives for the hydrology element of this Vision Plan are preservation and expansion of the space available for river function, mitigation of negative impacts from existing hydrological infrastructure, ensuring of adequate instream water in the lower river, and improvement of water quality.

MAKING SPACE FOR THE VENTURA RIVER

One important goal for this element is the preservation and enhancement of the natural river function — the wild quality — of the Lower Ventura River. The river can remain wild only as long as there is no substantial loss of the space that is available for its flows.

Although the course of the river has been significantly constrained by levees in the lower six miles that comprise the parkway zone, it has been spared from concrete channelization largely because a zone – wide in some areas, narrow in others – has previously been preserved exclusively for the flow of its floodwaters. The floodway (illustrated in Figure 7.2 and discussed in Chapter 3) is an area defined under FEMA flood insurance regulations, an area of river channels and floodplain that is important for the safe conveyance of occasional flood waters. FEMA flood insurance regulations discourage development in the floodway zone, and these policies are reflected in the Ventura County floodplain ordinance. Most of the land in this zone is above water, most of the time. It is a zone of mostly riparian ecosystems through which braided channels of the river move in changing configurations.

The floodway is a reasonable starting point for preserving and expanding the space that will be available to the river for its flow and function. This plan envisions preservation of both wet and dry portions of the current floodway as no-build, low impact areas where hydrological function is increased, native vegetation and wildlife habitat is emphasized, and human activities are limited.

The floodway of the Lower Ventura River is a unique place with characteristics that are largely determined by the geology, topography, soils, and climate of the watershed (see Chapter 3, Hydrology). Although large areas of the floodway are dry for much of the year, the entire zone, wet and dry, must remain available for the changing paths of the river and for the swift conveyance of occasional floodwater. A parkway that emphasizes passive recreational activities — and only those activities — in this zone furthers the goals of the county's floodplain management ordinance and General Plan while also expanding opportunities for human use and appreciation of the river.

Preservation means limiting development within that zone and designing parkway structures and visitor activities that are compatible with the movement of wild water.

Moving outward from the floodway, this plan seeks opportunities to preserve additional riparian space along the floodway edges — the area defined by FEMA as the floodway fringe. In some cases, this can be accomplished through the relocation of existing structures that are in the pathway of a 100-year (one percent annual chance) flood, a subject discussed further in Chapter 10, Cañada Confluence. Another possibility for expanding the river space is the setting aside of some agricultural edges for a return to riverine and riparian ecosystems, through mechanisms such as conservation easements, conservation subdivision, and fee title acquisition on a "willing seller" basis.

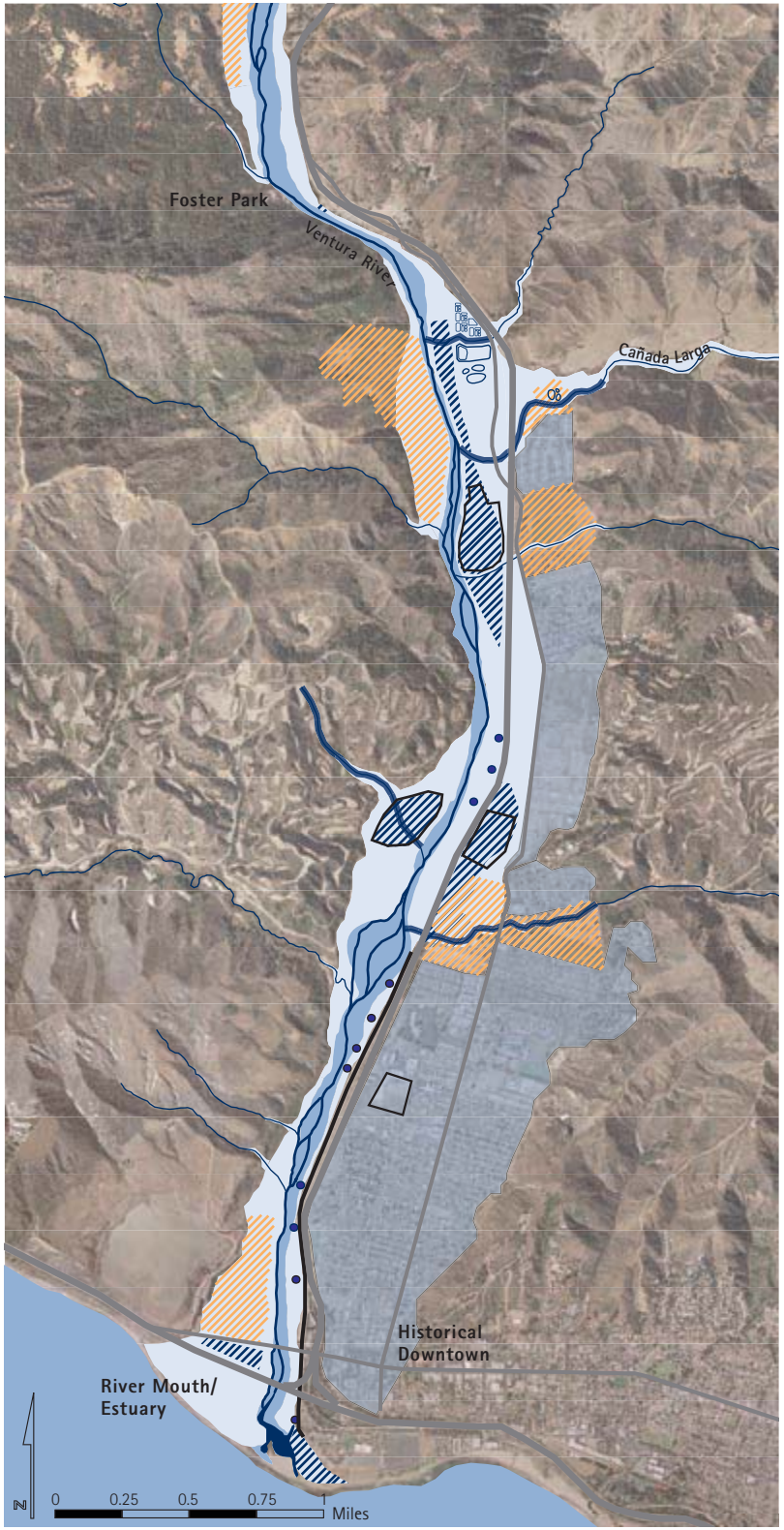
MITIGATING THE IMPACTS OF HYDROLOGICAL INFRASTRUCTURE

Hydrological structures within the proposed parkway corridor are addressed in several sections of this Vision Plan. The Army Corps levee on the lower river seriously impairs human access to and awareness of the river, and these effects are addressed later in this chapter and in Chapter 12, Downtown Delta. The Ojai Sanitation District Waste Treatment Plant has both beneficial and adverse impacts, and is addressed in Chapter 9, Cañada Confluence.

Some projected infrastructure changes will occur beyond the proposed parkway corridor. The removal of Matilija Dam, expected to begin during the next decade, is one of the largest and most complex dam removal projects undertaken in the United States, and it will have a significant beneficial

PARKWAY VISION PLAN

Hydrology Element



- FEMA floodway: no development
- Remove structures from 100-year floodplain
- Floodplain limited development areas
- River-friendly farming
- River-friendly neighborhoods
- Monitor/remediate soil and groundwater
- Urban storm water runoff treatment
- Constructed wetlands/polishing ponds
- Relocated Ojai waste treatment facilities
- Ventura water purification facilities
- Daylighted/Dechannelized Tributary
- Army Corps levee
- Highway 33

FIGURE 7.2 *Parkway Vision Plan, Hydrology Element.*

impact on the lower river. The dam has not performed any significant water storage function for many years, and its removal will not significantly increase the long-term supply of water to the lower river. However, removal will return the sediment flow in the river to something more closely resembling the pre-development regime, and it will supply additional sand to Ventura's depleted beaches. As landscape planning studies continue, the manner in which the return of sediment will occur and its impacts on the river are still uncertain (Greimann 2006). Despite this uncertainty, the project, with its improved sediment regime, presents opportunities for bank restoration, erosion control, and correction of riverbed elevations that will gradually help to correct impairments in the river in the proposed parkway area over the many decades to come. Due to the influence of dam removal, these stream restoration activities along the Lower Ventura River may not be amenable to any comprehensive plan at the present time. Feasibility studies indicate that the gradual adjustment of the Ventura River channel will require approximately 20 years after dam removal, and that there will be large variations in both flow and sediment supply during that period (Greimann 2006).

An additional impact from dam removal, the removal of barriers to steelhead trout migration, is discussed in the section Ecosystems.

The Los Robles Diversion Dam, the source for Casitas Lake and much of Ventura's drinking water, is not slated for removal. The dam has continuing impacts on river hydrology in the areas of instream flow, sediment supply and steelhead passage, and during the last decade it has been the subject of structural improvements and policy changes that attempt to address all three of these areas. Instream flow has been addressed to some extent by regulations that limit the amounts of water that may be diverted by the dam during low flow periods, while the dam's tendency to trap sediment is being addressed by plans that call for the construction of a high flow bypass structure to sluice sediment from behind the dam (Greimann 2006). Finally, the dam's status as a barrier to steelhead migration has been addressed by some extent through the construction of a fish passage facility during the past decade.

The future monitoring and adjustment of all three of these programs will be crucial to the functioning of the lower river so that the continued operation of the Los Robles facility, just one-and-one-half miles upstream from the proposed parkway, does not prevent the expected beneficial impacts of removing Matilija Dam.

Restoring Tributaries

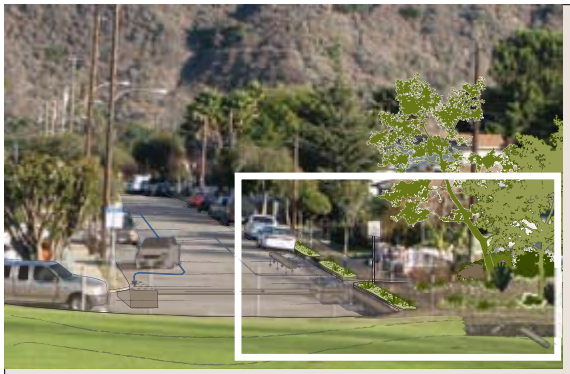
The healthy functioning of tributaries that meet the lower river in the parkway area is important because the river receives much of its water and sediment from those sources. In addition, tributaries are important corridors for connecting the main river with the surrounding hillsides which is crucial for wildlife movement and the dispersal of genetic material. These corridors also offer opportunities for hikers to branch out from the river parkway into those hillsides. This plan envisions opportunities for the daylighting or dechannelization of impaired tributaries where they meet the Lower Ventura River within the parkway area as well as the restoration of riparian ecosystems along those tributaries.

ENSURING ADEQUATE INSTREAM WATER

Humans and the river compete for the same water. Balancing the allocation of surface and groundwater between human users and instream flow will make more water available for sustaining healthy ecosystems and for natural river functions such as the movement of sediment. Efforts to maintain and increase instream flow need to take into account the history of competition for water between different groups of people, and between people and the needs of ecosystems, and the complicated water rights law that has developed out of that competition. The ensuring of adequate instream flow for the Lower River will require measures both within the parkway project and beyond, at the scale of the entire watershed.

Both within and adjacent to the parkway area, instream flow can be enhanced through measures that are designed to maintain and enhance the supply of water to the river. In this regard, it is critical to note that water users in the Ventura River Watershed have successfully avoided expensive and energy-intensive importation of foreign water through their reliance on surface water and groundwater pumping, and the continued future availability of this water for agricultural and domestic use is a matter of great concern for residents of the watershed. However, there are measures that can potentially enhance the availability of instream water without calling for a reduction in surface water diversions or pumping from wells, and some of these are mentioned below.

One important measure is the increased replenishment of groundwater basins through groundwater recharge. Increased recharge has the potential to directly supply water



ENVISIONING A RIVER-FRIENDLY NEIGHBORHOOD

Westside residential neighborhoods adjacent to the proposed parkway corridor consume scarce water for landscape irrigation, leaving less water for Ventura River flow. Polluted storm water runoff drains from impermeable road and hardscape surfaces in the same neighborhoods directly into the river Improved with Low Impact Development (LID) measures, the same neighborhoods can conserve water by consuming less and by capturing and cleaning storm water and returning much of it to groundwater basins. Figure 7.3 envisions the use of some of these measures at the corner of Prospect and Sheridan Streets in the historic Simpson housing tract less than 600 feet from the river. This example is based upon the Oros Green Street project designed by North East Trees in a neighborhood adjacent to the Los Angeles River (North East Trees 2007).

[LEFT AND ABOVE] FIGURE 7.3 *A river-friendly retrofit on Prospect Street.*

1. Permeable paved surfaces with sand/gravel substrate in appropriate areas filter runoff and allow it to penetrate instead of running off.

2. Parkway rain gardens with curb cuts capture both sidewalk and street runoff.

3. Runoff captured by rain gardens is filtered through sand/gravel substrate and enters perforated underground catchments to slowly enter the ground.

4. Additional runoff from driveways and sidewalks is captured by driveway trench drains and routed to catchments.

5. Any remaining street runoff is captured and enters cisterns at downhill end of street where coarse sediment settles out. Overflow is routed to pocket park for additional filtration/storage.

6. Pocket park on small lot at downhill end of street captures and filters large amounts of storm water for slow infiltration into the ground.

7. Drought tolerant and appropriate native plantings throughout the neighborhood consume less water and no invasive species are used.

8. Overflow from pocket park enters storm drain to river.

Illustration: Adapted from North East Trees 2007.

to the Lower River, and also has the benefit of improving the quality of the currently non-potable groundwater of the proposed parkway area and protecting that groundwater against saltwater intrusion at the river mouth.

One method for enhancing groundwater recharge is the preservation of the floodway and of areas of adjacent floodplain that are promising for groundwater recharge activities. The hydrology opportunities and constraints diagram in Chapter 6 (figure 6.9) roughly indicates areas that are promising groundwater recharge because they are nearly flat, overlie groundwater basins, and have permeable soil. Plan areas designated as floodway or floodplain open space (figure 7.2) overlie these recharge areas.

Potential recharge areas also underlie urban neighborhoods and farms that are adjacent to the proposed parkway. Recharge in neighborhoods can be enhanced through low impact development (LID) practices such as permeable pavements and widely-distributed street-level storm water treatment systems (figure 7.3) that capture, treat, and infiltrate storm water runoff near its source. LID practices, such as the use of drought-tolerant landscape plantings, also benefit instream flow by conserving water in developments that implement them. The controlled application of irrigation water on parkway farms (sidebar – A River Friendly Farm) would also conserve water. Water conservation means less competition between humans and wildlife for the water that is in the river.

Finally, within the parkway corridor, instream flow would be enhanced through the continuation of discharges of tertiary-treated effluent from the Ojai Valley Sanitary District Water Treatment Plant (Chapter 10, Cañada Confluence). The importance of the availability of high-quality effluent to the ecosystems of the Lower Ventura River should be balanced against any future proposals for reclamation of water from the treatment plant for other purposes.

Instream flow is also dependent upon policies and practices for water allocation at the watershed level, since water diverted from the river or pumped from groundwater basins for agricultural and domestic consumption in communities upstream from the parkway corridor is unavailable to the lower river. The County of Ventura has aggressively pursued policies for the conservation and allocation of surface and groundwater but the focus of these policies has been on watersheds other than that of the Ventura River (IRWMP 2006), and parkway stakeholders should actively consider the further development of these policies in the Ventura River Watershed as well, including:

- Conjunctive use, an umbrella term for a set of policies in which planners make the most efficient use of surplus surface and groundwater by transferring water supplies between these two sources (and between adjacent groundwater basins in some cases) and by making flexible allocations of water to agricultural and domestic consumers depending on where surplus water exists (IRWMP 2006).

- Groundwater management, in which removals for agricultural and domestic consumption are directly regulated through groundwater agencies, formal plans and agreements, ordinances, and in some cases, court adjudication in accordance with a water budget for the watershed (IRWMP 2006).

Many other policies and programs including ecosystem restoration, flood protection, land use planning, water quality protection, and water recycling, discussed at length in the county's Watershed Management Plan (IRWMP 2006), have an impact upon the availability of instream water and warrant continued attention at the watershed level in furtherance of parkway objectives.

Many of these programs are aimed at making the best use of storm water through storage mechanisms such as surface reservoirs or spreading basins for groundwater recharge. However, in rerouting storm water for these purposes, planners should remember that even during wet periods when channels are overflowing their banks, water that is needed by wildlife and riparian vegetation or for the natural processes of sediment transport should not be viewed as surplus; achieving an appropriate balance between the role of storm water in natural river processes and its use as surplus supply for consumers is an important subject for continuing research.

MANAGING FLOOD RISK

Taking Flood Risk Seriously

The Lower Ventura River has been extensively altered by the 1947 Army Corps levee as well as numerous smaller levees for the purpose of protecting developments in the floodplain, such as the residential neighborhoods of North Avenue and Westside, from periodic extreme flood events. The risk of property damage and personal injury from flooding is a subject that cannot be ignored in any vision of the Parkway.

Flood damage can be nearly eliminated if people remove all floodplain developments and abstain from further

building in the floodplain – in that event, much of the Lower Ventura River Valley would be returned to a natural floodplain. However, this Plan arises in the context of a floodplain that has already been heavily developed on the eastern side of the river for nearly a century. In a post-oil 21st century, it is reasonable to foresee the gradual disappearance of industry from the Lower River, but no existing plan contemplates the abandonment of the floodplain and the relocation of the residents of North Avenue and Westside. On the contrary, the City of Ventura contemplates the annexation and residential and commercial development of neighborhoods along the east side of the lower river. In that context, no Parkway facilities or activities would be developed that would remove existing structures built for protection against flood damage.

Protecting Parkway Structures and Users From Flood Risk

Although structures in the floodway itself will be limited or nonexistent, this parkway plan envisions an increased presence of human visitors. Wayfinding and interpretive signage and related structures should be located away from areas where channels frequently flow, and designed to offer minimal resistance to the flow of water during flood events and minimize damage to the facilities during those events.

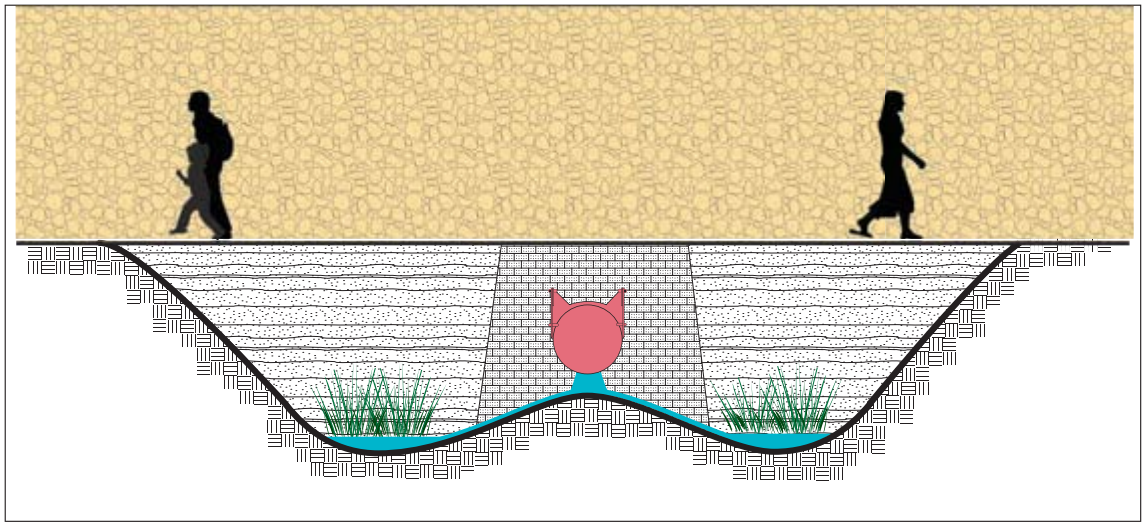


FIGURE 7.4 *Bioremediation swales to treat urban runoff entering the river through the levee wall.*

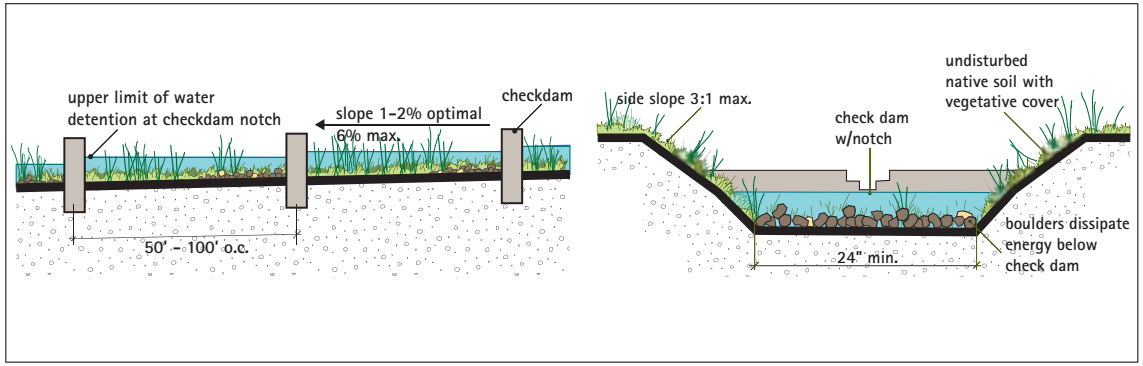


FIGURE 7.5 *Longitudinal and cross-sections through a typical vegetated swale. Adapted from BASMAA 1999. Not to scale.*

Any visitor activities allowed in the floodway would necessitate adequate early warning systems and evacuation procedures to protect visitors from personal risk from floods that can and do arise here on short notice.

Acknowledging and Celebrating A History of Floods

Flooding is a risk that must be taken seriously in the parkway, but it is also an opportunity for fascination, awe, education and increased stewardship. The parkway project would exploit every available opportunity for educating users about the natural occurrence of floods, including occasional opportunities for rainy-day visitors to view flood waters from sheltered, safe locations (See sidebar Experiencing a Flood in the Culture Element of this chapter).

IMPROVING WATER QUALITY

This Plan envisions opportunities for enhancing the quality of water in the Lower Ventura River in three ways: by treating urban storm water runoff, treating agricultural runoff, and by improving treatment plant effluent.

Treating Urban Storm Water Runoff

Recognizing that untreated storm water runoff from the urban areas of Ventura and its surrounding unincorporated neighborhoods is a major potential source of pollutants in the river, this Plan recommends several approaches for a reduction in the quantity of runoff and the reduction of pollutants in that runoff. The first of these approaches emphasizes the capture, cleaning and infiltration of runoff at the source, street by street in residential, commercial and institutional neighborhoods on the east side of the river. Capturing runoff at the source, one aspect of the Low Impact Development (LID) practices described in Appendix B, would reduce the quantity and improve the quality of runoff while also helping to replenish groundwater supplies, and would be equally applicable to parkway facilities themselves.

Second, storm water runoff would be further treated at the outfall locations where it currently enters the lower river. Figure 7.4 shows a typical storm drain outfall with a hinged cap where it exits the base of the Army Corps levee into the floodway fringe of the river. Approximate locations of many of these outfalls are noted in Chapter 6, Hydrology Opportunities and Constraints.

Currently, polluted runoff exiting the levee wall at each of these outfalls enters a deep dirt and rock-lined swale that conveys it to the main stem of the river with minimal treatment. As illustrated in Figure 7.4, this situation could be improved by conveying the runoff from each of the outfalls into multiple shallow swales that would perform a bioremediation function based on filtration through selected plants. The gentle side slopes and bottom of a swale consist of native soil planted with grasses and rushes that are genetically appropriate for this ecosystem and have a proven ability to filter pollutants. Some plants with proven bioremediation potential that might warrant consideration, including bentgrass (*Agrostis exerata*), California brome (*Bromus carinatus*), and red fescue (*Festuca rubra*) are California natives, and one rush, Juncus, is a native to the Ventura River that had significant uses among the Chumash. Checkdams at intervals slow down the flow of water through the swale increasing filtration of pollutants as well as infiltration into groundwater. In areas with poor soil drainage, a perforated drain pipe can be installed underneath the swale to carry treated runoff away, but that is not necessary in this location, in well-drained alluvial soil over a groundwater basin.

Treating Agricultural Runoff

Agricultural runoff that can be rich in nitrates, phosphates, and fecal coliform can have an impact on water quality both in tributaries such as the Cañada Larga (where fecal coliform is listed as a Section 303(d) impairment) and in the Ventura River itself. A “river-friendly” farm is one where potential pollutants are contained and eliminated at their source. Figure 7.6 illustrates how this approach could be implemented by a floodplain farm to treat wastes from both crop and livestock operations. Practices such as improved monitoring that limits fertilizer applications to the root zone of plants, or irrigation that is controlled by evapotranspiration monitors, can reduce pollutants before they accumulate in runoff or leach into groundwater. Swales planted with appropriate native plants can gather and filter nutrient-laden runoff from farm operations, while larger amounts of runoff can be also be treated on-site in surface or subsurface constructed wetlands. Native plant buffer zones around the edges of crop operations, particularly where the farm meets the river corridor, can provide additional protection from runoff reaching the river, while also provided valuable wildlife habitat.

Improving Treatment Plant Effluent

Recognizing that treated effluent from the Ojai Wastewater Treatment Plant makes up a significant portion of the lower river’s water, this Plan envisions several measures to enhance the quality of that effluent, discussed in Chapter 10, Cañada Confluence.

FIGURE 7.6 *A river parkway farm.*

1. Bioremediation swales
2. Buffer zone
3. Subsurface-flow constructed wetland

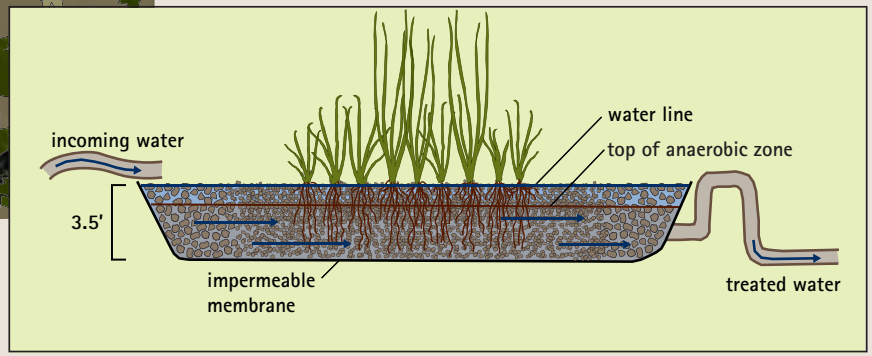


FIGURE 7.7 *Subsurface-flow constructed wetland. Adapted from Lyons 2006.*

ENVISIONING A RIVER-FRIENDLY FARM

Ventura City and County have placed a high priority on preserving their agricultural heritage. Parkway corridor farms are not only compatible with parkway objectives in general, but actually further those objectives by keeping land in open space, providing limited but valuable habitat for wildlife, and helping to keep nearby urban residents in touch with where their food comes from. Although riverside farming activities can impair water flow and quality by consuming excess irrigation water and contributing leachate and runoff with excess nitrates, bacteria, and other pollutants, many farming practices are evolving that can mitigate these impacts. Figure 7.6 envisions an existing farm adjacent to the lower river as a proving ground for these practices:

1. Bioremediation swales at the edges of plots capture and treat crop runoff in addition to providing habitat for birds, reptiles and small mammals.

2. Some farmland is dedicated through a conservation easement or conservation subdivision to widen a buffer zone of riparian vegetation between the farm and the river. This zone not only protects the river but also enhances farm productivity by hosting bees that pollinate crops and birds and insects that help control crop pests.

3. A subsurface-flow constructed wetland (detailed in figure 7.7) is a low-maintenance, high-volume solution that can treat agricultural runoff that might otherwise flow untreated directly into the river. Bulrush (*Scirpus* ssp.) and cattails (*Typhus* ssp.), two plants that are native to this valley, grow with grasses in a matrix of gravel through which farm effluent slowly flows. Bulrush carries oxygen from its shoots down into its roots in the anaerobic region of the gravel, creating micro-aerobic zones that convert nitrates/nitrites through several stages into harmless nitrogen gas. Meanwhile, the gravel surfaces form a microscopic biofilm that can remove phosphorus, heavy metals and pathogenic organisms (Lyons 2006).

Other potential practices that are not illustrated in figure 7.7 are the use of sensors that monitor nutrient concentrations and evapotranspiration in the soil on a yard-by-yard basis so that fertilizer and water are applied only where, and only in the amounts needed by crops. This conserves water and helps to prevent fertilizer from leaching into groundwater.

Ecosystems Element

Key objectives for the ecosystems element of this Vision Plan are to restore and enhance ecosystems, enhance biodiversity, increase habitat connectivity, and manage invasive species.

RESTORING AND ENHANCING ECOSYSTEMS AND BIODIVERSITY

The ecosystems element of the Vision Plan is an extension of the hydrological element. Enhanced biodiversity and the health of all ecosystems in the parkway area are inextricably linked to quality of hydrological functions. Therefore, most of the actions recommended for meeting hydrological objectives also serve to enhance biodiversity. River corridors tend to be the most dynamic place in landscapes (Forman 1995) and the hydrological activity of rivers with varying flow rates, occasional floods, lateral migration of channels, gravel bars that appear and disappear with accompanying vegetation, and a changing network of pools, riffles, and snags in the channels themselves naturally supports habitat heterogeneity, a key to biodiversity (Forman 1995).

This Plan envisions the preservation of the existing mixed riverine and riparian habitat of the river floodway, designating that area as one for low-impact activities only. Riverine habitat, home to aquatic plants and harboring many design species identified in Chapter 5, dominates in those areas where the river channel frequently runs. Gravel bars accumulate in between the river channels and are host to riparian plants that provide valuable shade for the river water as well as cover and food for animals.

Mature trees are relatively infrequent along the Lower River, due to the scouring action of floods in recent years and competition by invasive species. However, the eventual eradication of invasive *Arundo donax* will encourage the return of more trees, and when multi-year dry weather periods occur, some of those trees will establish themselves to the extent that they can survive flood scouring (Capelli 1991).

In the floodplain outside of the floodway (riverbed), many areas of riparian habitat would be expanded through the conversion of existing industrial infrastructure (much of it close to abandonment) to restored open space. This zone would include areas of parkland, mostly of riparian nature but also including oak woodland and coastal sage scrub environments. Some of these would be reserved for vegetation and wildlife and low-impact human activities, while others would be mixed uses. The creation of a greenbelt along the east edge of Highway 33 would bring the highway into the parkway rather than leaving the highway itself as the border of the parkway.

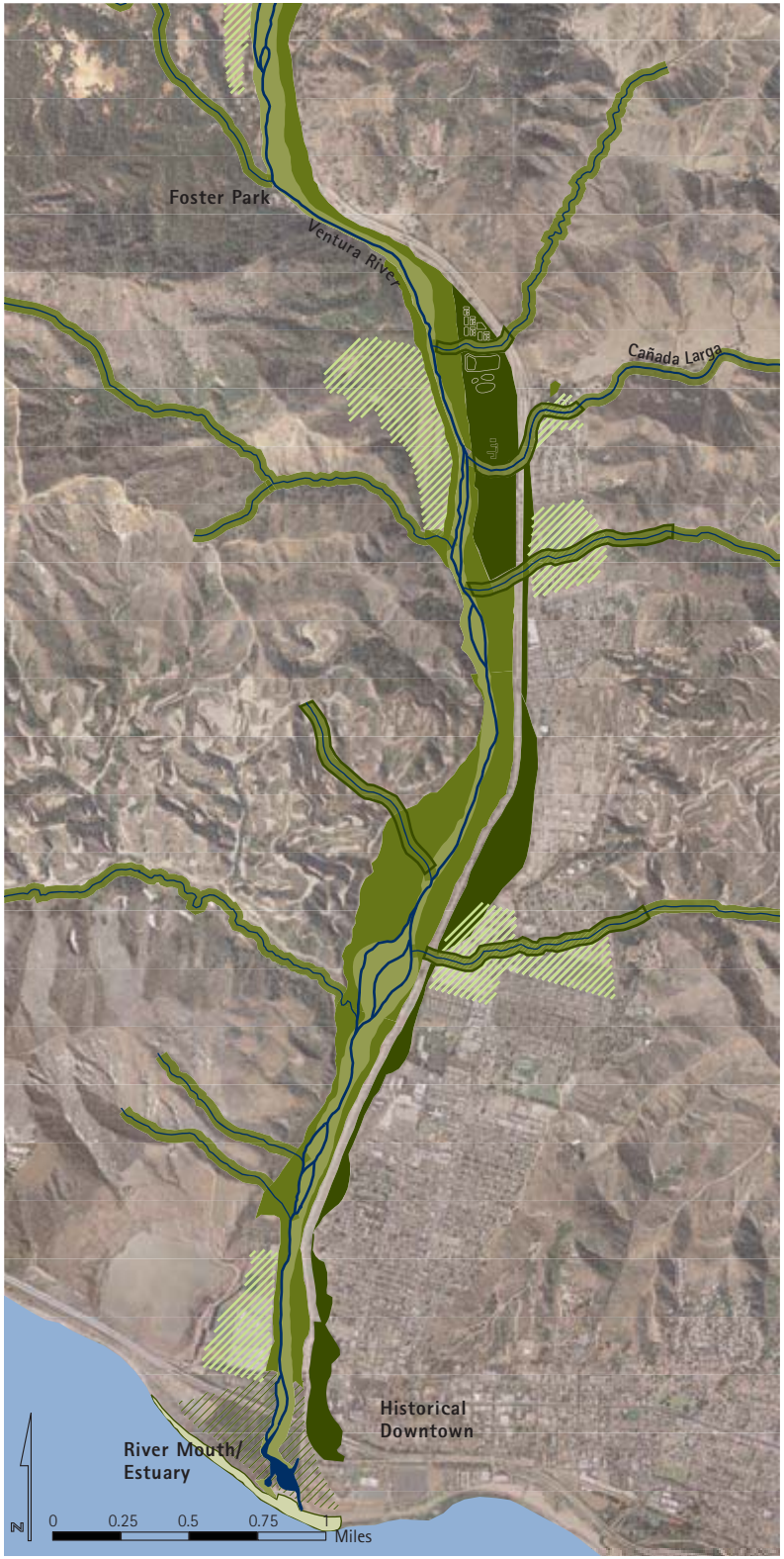
Parkway farms would also play a role in enhancing biodiversity. Within and around the proposed parkway corridor, river-friendly farms (see Hydrology Element, this Chapter) would incorporate vegetated swales and buffer zones of native vegetation around their edges, providing valuable support for many species while also enhancing their own productivity through enhanced opportunities for pest control and pollination of crops.

This Vision Plan would expand three threatened habitat areas: estuary, coastal wetlands and coastal dunes.

In and around visitor facilities and more developed areas

PARKWAY VISION PLAN

Ecosystems Element



- Ventura River
- Tributary corridor for restoration
- Floodway — Riverine/Riparian
- Riparian
- Greenbelt (mixed riparian/woodland)
- Estuary
- Dune
- Farming

FIGURE 7.8 *Parkway Vision Plan, Ecosystems Element.*

of the parkway corridor, the maintenance of ecosystem services would be enhanced through the use of a palette of California native plants that are designed to emulate preexisting or neighboring ecological communities and to increase visitor appreciation for these communities.

INCREASING HABITAT CONNECTIVITY

Fragmentation of prime wildlife habitat into smaller and smaller patches under modern development pressures reduces biodiversity and threatens the survival of viable populations of plant and animal species.

Fragmentation can be reversed by actively forging connections between large habitat patches, connections that enable individuals of many species to circulate between those patches (Noss and Cooperrider 1994). This Vision Plan recognizes that river corridors such as the proposed Lower Ventura River Parkway are critically important as connectors for several reasons. First of all, river corridors themselves are inherently dynamic and rich in biological activity. As inherently heterogeneous environments, they can support the needs of many diverse species moving through them (Forman 1998). Secondly, the ubiquitous pattern of slopes and drainages across most landscapes means that connected rivers and streams reach nearly everywhere.

This Plan envisions the Lower Ventura River Parkway as a habitat connector in two distinct ways: Locally, as a means of connecting the riverine and riparian habitat of the lower river itself with large habitat patches on the surrounding hillsides; regionally, as one element of a larger corridor connecting the lower river and the Pacific Coast with large, significant patches of prime habitat in northern Ventura and Santa Barbara Counties. These two distinct functions are discussed below.

Local Connections

For the purposes of landscape ecology, a river corridor is considered to be a band of vegetation that encloses a water course. It may be as narrow as a stream and the adjacent banks, but it can also include the adjacent floodplain, hillsides rising from the floodplain, and an adjacent upland area (Forman 1995). Locally, the Lower Ventura River functions as a connector within its own floodway by supporting the movement of species up and down the six miles of the proposed parkway area.

The proposed parkway corridor would also function as a connector to local habitat outside the floodway by encouraging movement between the riverbanks and habitat areas within the adjacent floodplain, hill slopes and upland areas.

In 2002, the California Department of Forestry and Fire Protection (FRAP) classified California land according to its management status and habitat value. Figure 7.9, reflecting the results of that classification, illustrates that most of the land on hillsides both to the east and west of the floodplain of the lower river is "working" open space that retains "considerable habitat value for native species" (FRAP 2002). A notable exception is the swath of open space devoted to oil production, which virtually cuts the hillside habitat in two. While this impaired landscape may eventually be targeted for restoration, for the moment the river itself may serve as a means of connecting the hillside habitat that is fragmented by it. Virtually all of the open space shown in figure 7.9 is designated as an area of interest by the Ventura Hillsides Conservancy, prioritized by that organization for eventual protection as open space (Ventura Hillsides Conservancy 2008). Examples of species that would circulate between the lower river and these hillsides within their ranges are bobcat (*Lynx rufus californicus*), and gray fox (*Urocyon cinereoargenteus).*

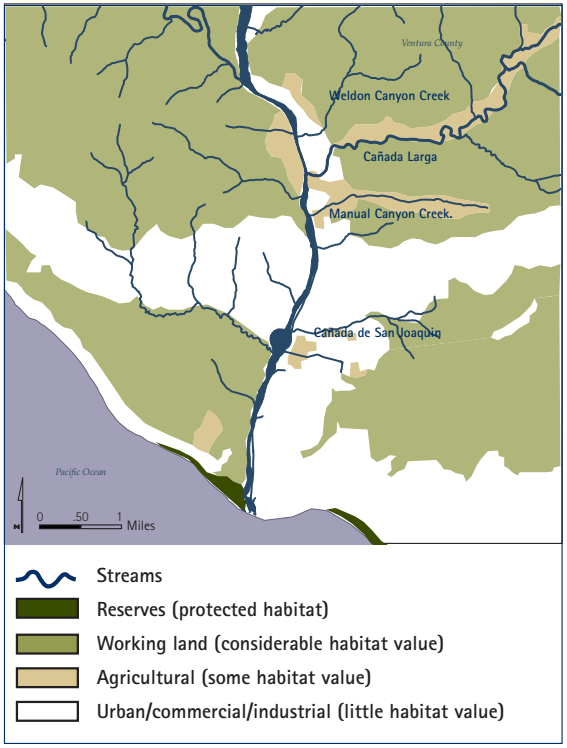


FIGURE 7.9 *Proposed parkway area — Management status and presumed habitat value of land. The four named tributaries would potentially connect the Ventura River with hillsides to the east. Coverage is approximate, subject to change since the date of origination of this data. Data source: California Department of Forestry and Fire Protection 2002.*

Width and connectivity are key determinants of the effectiveness of corridors as habitat (Forman 1995). The current capability of the Lower Ventura River to serve as a habitat corridor varies along the length of the proposed parkway between the estuary and Foster Park. The floodway itself is continuous for the entire six miles of the proposed parkway area, and is at least 200 yards wide from the estuary to Shell Road. However, for about one and one-half miles upstream from Shell Road, it ranges from only 50 to 75 yards wide. The minimum width of a riparian corridor for effective movement of a wide range of terrestrial species is subject to many factors, a determination beyond the scope of this document. However, it is reasonable to assume that the effectiveness of the parkway as a corridor will vary along with its width.

Approximately four and one-half miles of the Lower River connect directly with adjacent slopes and upland areas to the west, affording excellent opportunities for movement between the two. The floodplain and hillsides to the east of the river are another story. The presence of the Army Corps levee, Highway 33, and significant urban and industrial development in the floodplain may be expected to deter most animal movement across the floodplain into the western hillsides.

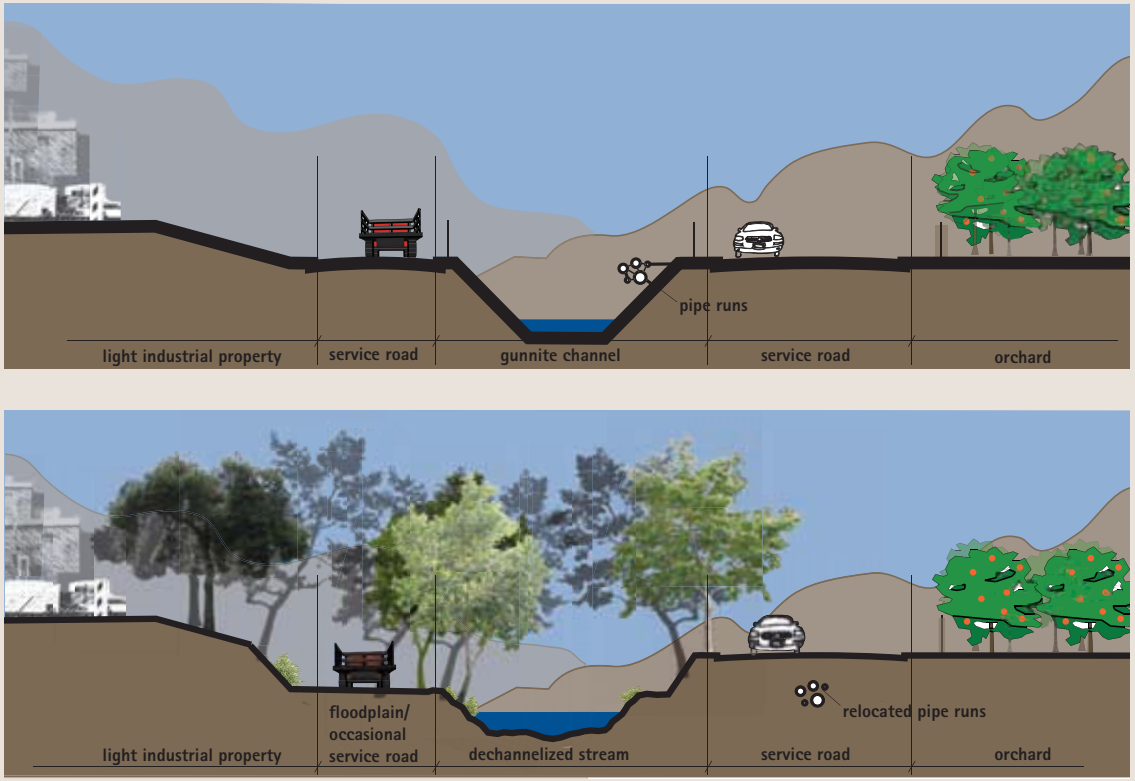
ENHANCING THE CORRIDOR FUNCTION OF A TRIBUTARY

This Vision Plan identifies tributaries to the east of the Lower Ventura River as one strategy for reducing habitat fragmentation and connecting the lower river to the hillsides to the east. Tributaries that would perform this function include the Cañada de San Joaquin, Cañada Larga, and Weldon Creek (figure 7.8 — Ecosystems Plan Element). One significant advantage in relying on tributaries for these connections is that, for hydrological purposes, these water courses already safely navigate through the developments on the floodplain and already penetrate Highway 33, the most significant barrier to wildlife movement across the floodplain. For species other than those that live in riverine environments, the key feature of a river corridor is not the water itself, but the vegetated strip that reaches out from the water (Forman 1995). Thus, the key to using the connective potential of these tributaries is to enhance the riparian buffer zones along their edges.

Cañada de San Joaquin (figure 7.5) is an example of how this potential ecosystem service could be enhanced. In its existing state where it crosses Ventura Avenue near its confluence with the Lower Ventura River, the stream is tightly contained between a dirt-surface industrial service road to the north and a paved industrial and agricultural service road to the south. Virtually all that remains in between, at the point illustrated in figures 7.5 and 7.6 (upper) is a narrow gunnite channel that serves as a conduit for runs of petroleum pipe.

Figure 7.6 (lower) shows a proposed method for creating a narrow but functional strip of riparian habitat along this tributary, without taking away space that is currently devoted to industrial and agricultural transportation. Instead of maintaining the stream as a deep channelized ditch between two roads, the dirt road surface (to the left of the stream on this section) is lowered to an elevation closer to the base elevation of the stream itself, enabling it to function as a limited floodplain and riparian space and effectively widening the corridor while still allowing occasional use as a service road. Adding this floodplain makes it possible to dechannelize the stream itself. With the addition of riparian canopy to shelter wildlife and lower the temperature of the stream's water, a small but effective habitat corridor may be effected. For another example of enhancing these habitat connections, see the "daylighting" of Cañada Larga where it crosses Highway 33, illustrated in Chapter 10, Cañada Confluence.

FIGURE 7.10 *Cañada de San Joaquin, existing condition adjacent to Ventura Avenue.*



[RIGHT] FIGURE 7.11 *Upper: Cañada de San Joaquin, existing condition. Lower: An alternative for enhancement in approximately the same space. Concept adapted from Riley 1998.*

Based on the foregoing, this Vision Plan identifies the following general strategies for increasing local habitat connectivity within and adjacent to the proposed parkway area:

- Increase the width of the riparian corridor wherever possible upstream from Shell Road by preserving additional open space, particularly in the "pinch" between the refinery and water treatment plant and the avocado orchards to the west.

- Preserve the existing connectivity between the lower river and the hillsides to the west and maintain the undeveloped lands characteristic of the west bank by limiting visitor access primarily to hiking and related activities, consistent with recommendations elsewhere in this Plan.

- Enhance the function of tributaries, particularly the Cañada de San Joaquin, Manuel Canyon Creek, Cañada Larga, and Weldon Creek as a means of providing for wildlife passage across Highway 33 and the developed floodplain and into the hillsides to the east.

- Promote the preservation of open space in the adjacent hillsides to the east and west of the proposed parkway, in accordance with efforts of the Ventura Hillsides Conservancy.

Regional connections

The Lower Ventura River Parkway has the potential to connect the Pacific Coast with prime inland wildlife habitat in a network reaching across Southern California. Science and Collaboration for Connected Wildlands, a nonprofit organization working with ecologists, land managers, and planners, implemented the South Coast Missing Linkages Project to plan a regional conservation strategy that stretches from the Southern California Coast to the Sierra Nevada ranges at the eastern edge of the state (South Coast Wildlands 2008). The results of this analysis have been incorporated into the California Essential Habitat Connectivity Project (CEHCP), with input from more than

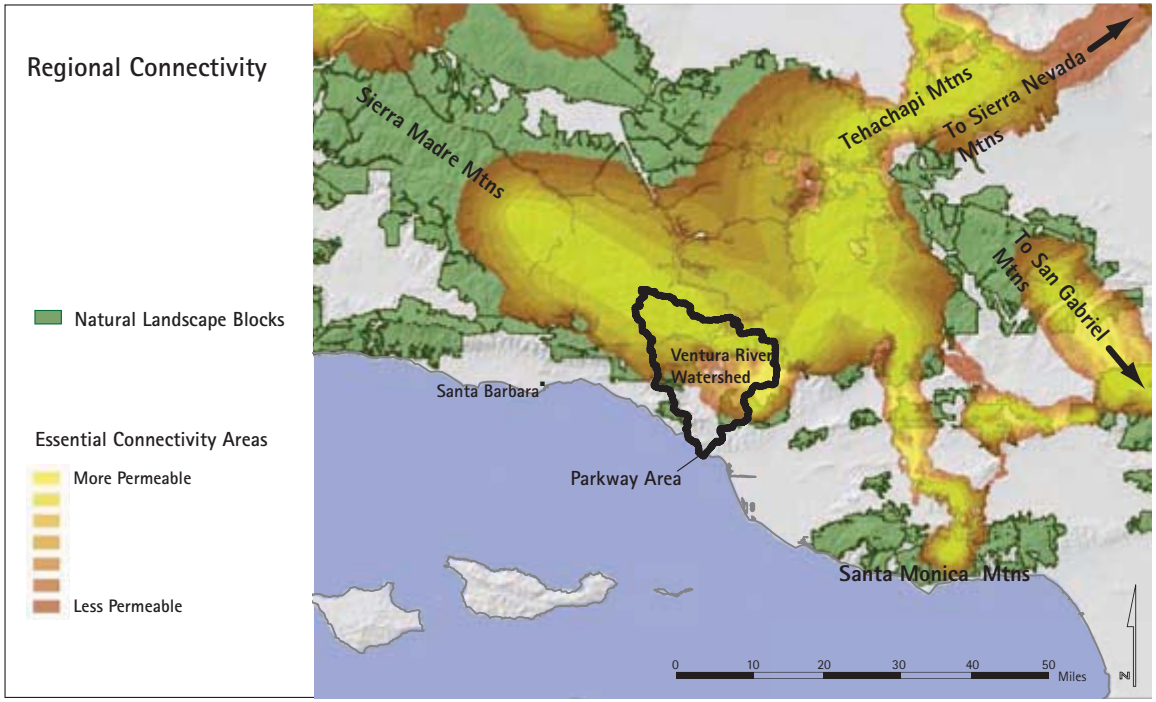


FIGURE 7.12 *The Ventura River Watershed in relation to Natural Landscape Blocks and Essential Connectivity Areas identified by the South Coast Missing Linkages Project and incorporated in the California Essential Habitat Connectivity Project. Data Source: Spencer et al 2010.*

sixty agencies across the state. The CEHCP identifies Natural Landscape Blocks, large natural areas with sufficient ecological integrity to support native biodiversity, and also identifies areas that are essential for future ecological connectivity between those blocks. Figure 7.12 shows this analysis for the region surrounding the Ventura River Watershed, with Natural Landscape Blocks larger than 2000 acres shaded in green. Overlapping areas that range from orange to yellow are identified by the CEHCP as Essential Connectivity Areas that could potentially ecologically connect these areas with each other and with other natural areas across California. The upper portion of the Ventura River Watershed (delineated in black on Fig. 7.12) reaches directly into one such connectivity area that could potentially connect with the Tehachapi and Sierra Nevada Ranges to the northeast, the Santa Monica Mountains to the southwest, and the San Gabriel Mountains to the east (Spencer et al 2010). Although the proposed parkway area on the lower river is not within this identified connectivity area, it has a riparian corridor connection with it and the parkway could be an exciting laboratory for exploring the biodiversity effects of relationships between inland mountains and the sea. Perhaps the most notable example of a species that directly connects these landscapes is the Southern California steelhead trout. However, the potential for migratory routes or other connections up and down the river certainly exists for many other species. One example of a potential terrestrial relationship is the bobcat (*Lynx rufus californicus*). Although the average range of an individual of that species is smaller than the distance between the coast and the National Forest, the potential for many individual ranges to overlap along this corridor might reduce inbreeding and enhance survivability. While a full discussion of the potential importance of the river as the connector between mountain and sea is beyond the scope of this Vision Plan, that limitation is also an opportunity

– exploring this subject would be one theme for visitor education and stewardship programs in the parkway, a way of fostering bioregional citizenship.

California Wildlife Action Plan

The California Wildlife Action Plan, completed in 2007 by the UC Davis Wildlife Health Center for the California Department of Fish and Game, focuses on the conservation of ecosystems and habitat at the regional level, and identifies the Ventura River as a "largely intact" drainage that is regionally important. The document contains detailed guidelines that urge federal, state and local agencies and nongovernmental organizations to work together toward goals that include the protection and restoration of "the best remaining regional examples of ecologically intact river systems" (Bunn et al. 2007). Plan guidelines that agencies should follow in implementing the proposed river parkway include:

- development of regional Natural Community Conservation Plans
- protection of regional linkages identified by the South Coast Missing Linkages Project, discussed above
- a focus on the protection and restoration of coastal wetlands habitat
- eradication or control of invasive species and the prevention of new introductions
- protection of sensitive species and important wildlife habitats
- development of a comprehensive Southern California Outdoor Recreation Program to ensure that recreational access does not conflict with wildlife needs

A Planting Palette for the Parkway

The parkway concept presents many opportunities for restoration of existing plant communities in floodplain areas that are retained in a wild state, as well as new plantings for mixed use areas such as urban parks, streetscapes, and visitor facilities. All parkway activities will be in close proximity to the ecosystems associated with the river and every planting activity regardless of its purpose will have an impact on the vitality of the native plant communities that are part of those ecosystems. Therefore, for all restoration programs or landscape designs, this Vision Plan recommends using native plants and seeds from local, genetic sources. Using genetically local species will enhance the local character of the area and will also aid in fulfilling two ecosystem objectives of this plan, the restoration of historical and existing ecosystems and the enhancement of biodiversity.

Exotic plant species that lack local predators often directly compete with native species for growing space and nutrients, suppressing natives due to short-term competitive advantages. However, what is less obvious – and equally important – is that only local native plants can support the existence of the ecological communities upon which humans depend. Locally-evolved native plants are tightly integrated in a web of relationships that support every link in the food chain. This web starts with native insects and birds that have a demonstrated preference, often exclusive, for trace chemicals in the food provided by plant species with which they have co-evolved (Tallamy 2007). Therefore, every introduction of an exotic species in the vicinity of wilderness areas threatens to suppress every form of life in that ecosystem. The use of local species avoids this harm, and aids in the preservation of genetic integrity and diversity, and has the added benefit of relying on plants that are better suited to succeed under local environmental conditions with minimal water and fertilization.

Since this Vision Plan represents an early stage in the development of the Lower Ventura River Parkway, now is the appropriate time for the commencement of collection of local, native plant seeds that can be cultivated in anticipation of future revegetation projects. Initial local collection and cultivation efforts should emphasize slow-growing and longer-living plants, while faster growing plants and seeds can be cultivated closer to the date of design implementation. These activities can tie in with other important objectives of the parkway by affording opportunities for civic involvement and stewardship that also educates.

Considerations for selecting appropriate plant palettes for each of the design sites should be based on species native to the design area and local plant communities, aspect, soil, and available water. Since soil and available water surveys are beyond the scope of this Vision Plan, and premature in the case of remediation sites, plant palette recommendations in this Vision Plan are based on species native to the area and local plant communities. These recommendations are not comprehensive, but rather should serve as a general guide pending more specific surveys.

Limiting Equestrian Activity

The least Bell's vireo and other threatened bird species experience significant breeding disturbance as the result of nest-parisitism by cowbirds, which are attracted by equestrian activity. An active cowbird control program has been initiated on the Ventura River (Hunt 1994). For this reason, multi-use trails, nature trails and other circulation systems (Chapter 8) that approach the river floodway or adjacent riparian zones throughout the proposed parkway should exclude equestrian activity.

California Endangered Species Act

Implementation of a long-range parkway project will involve many actions that directly impact riverine and riparian ecosystems, including trail alignments, streambank restoration, programs that may bring more people into contact with the riparian areas, and visitor facilities that may include construction, hardscape, and planting projects. For the protection of threatened or endangered species and their habitats, all implementation steps including both construction and operation over the life of the parkway, should be carefully reviewed for compliance with the California Endangered Species Act (CESA), including the issuance of incidental take permits where they are warranted under the provisions of CESA

STEELHEAD TROUT RECOVERY

The National Marine Fisheries Service (NMFS) has designated the Ventura River, its major tributaries, and the estuary at its mouth as critical habitat for the recovery of Southern California steelhead (*Oncorhynchus mykiss*), a species that has been listed as endangered under the federal Endangered Species Act since 1997 (NMFS 2005). For a discussion of the life cycle of this species in relation to project area ecosystems. Critical habitat is defined as "specific areas in which are found physical or biological features essential to the conservation of the species, and which may require special management considerations or protection" (NMFS 2007). Although steelhead trout have historically been present and are currently present in the Ventura River Watershed, annual runs are estimated to have declined by 90 percent or more (NMFS 2007). "Recovery," for the purposes of the ESA, would mean the restoration of the species and its ecosystem to the point that its future is safeguarded (NMFS 2007).

The Endangered Species Act requires the NMFS to develop and implement recovery plans for species that the agency has listed as endangered, and NMFS has placed a high priority on the development of a recovery plan for steelhead that will be issued in draft form in 2008 (NMFS 2007). The NMFS recovery plan strategy relies primarily on a widely dispersed set of core populations in inland areas and large watersheds, including the Ventura River Watershed, that are capable of sustaining larger populations (NMFS 2007). There are few such core populations in Southern California, and they have low redundancy due to the impact of dams, water diversions, flood control measures and urbanization, as well as wildfires (NMFS 2007). Due to this low redundancy, the NMFS has specifically stated that the restoration of water flows and fish passage in the Ventura River are "necessary steps" to achieving the viability of the Southern California steelhead population (NMFS 2007). The unique and specific importance of the Ventura River Watershed to steelhead recovery efforts warrants a special focus on this species in this Vision Plan.

A strategy for addressing steelhead recovery in this Vision Plan starts with acknowledging the fact that this species historically adapted and thrived in Southern California in the face of environmental stresses that are somewhat unique to this region with its arid Mediterranean climate, challenges that are not common for more northern populations. Highly variable seasonal precipitation patterns result in years when the flow of river water is insufficient to open the sand bar at the river mouth, blocking passage both to and from the ocean (NMFS 2007). Periods of low precipitation combined with certain riverbed geological formations can lead to interruptions in surface flow along sections of rivers, further blocking steelhead passage (NMFS 2007) (Chapter 4, Figure 3.23 illustrates an area of occasional interrupted surface flow in the Ventura River near Foster Park). Flood scouring during the rainy season, described in Chapter 4, has both harmful and beneficial impacts on steelhead. It removes riparian cover and can result in unhealthy high water temperatures during subsequent summer-fall low-flow conditions. However, it also clears water passages and flushes out fine sediments, leaving gravels more suitable for spawning and fry (NMFS 2007).

Southern California steelhead trout have adapted to these regional stresses in several ways. Some research suggests that they have developed the ability to survive in higher water temperatures than their more northern relatives (Leydecker and Grabowski 2006; Capelli 1997). Other research suggests that anadromous steelhead trout populations survive blockage of the river mouth and other barriers further up the river through life history switching (NFMS 2007). According to this research, individuals that have been blocked from migrating to the ocean by a sandbar may become lagoon anadromous, spending a season in the estuary at the river mouth before migrating to the ocean. Similarly, individual steelhead trout that have been prevented from migrating to the ocean by low surface water or other barriers to passage may become freshwater resident in the upper river for all or part of their lives, and their progeny can revert to anadromous behavior (NMFS 2007).

While the natural stresses described above don't need "fixing," they result in a local population that has wide variation in run size from year to year (NMFS 2007), and this has significance for recovery efforts: a population that experiences "good years and bad years" in terms of run size (and reproduction) may live closer to the edge of survivability, magnifying the impact of human changes such as water pollution and dams. Therefore, a recovery strategy for this Vision Plan envisions the preservation and enhancement of natural river functions (such as pool and riffle formation) that are already employed by steelhead trout in their struggle for survival, as well as the removal of man-made pollution and of barriers to migration such as dams. Figure 7.9 summarizes threats to steelhead trout survival identified by NMFS in its interim recovery plan, parkway features to address those threats, and broader policies for the entire watershed.

Threat Factors		Recommendations	
Description	**Impact**	**Parkway Area**	**Watershed**
Threats to habitat and range:			
Alteration of natural stream flow patterns and floodplains; physical impediments to fish passage (NMFS 2007)	• Blocked passage to and from spawning areas • Loss of localized "survivable areas" such as pools, snags • Lack of vegetative canopy	• Reduce water consumption through conservation to leave more instream flow • Preserve unchannelized status of Lower Ventura River • Prevent development in the floodway	• Reduce water consumption through conservation to leave more instream flow. • Implement Matilija Dam Ecosystems Restoration Project • Develop and implement fish passage facility for Casitas Dam • Monitor function of fish passage facilities at Los Robles Diversion dam for improvements as needed
Alteration of sedimentation regime	• Disturbance of gravels used for spawning and sheltering of fry	• Preserve unchannelized status of Lower Ventura River • Prevent development in the floodway	• Implement Matilija Dam Ecosystems Restoration Project • Monitor and improve function of sediment screening at Los Robles Diversion dam
Waste discharges	• Excess nutrients in stream water • Excessively high water temperature	• Arboretum and polishing ponds • Distributed storm water treatment • Promote volunteer water quality monitoring	• Enhance agricultural practices and storm water treatment practices at watershed level
Exotic species	• Interference with hydrologic function (*Arundo donax*, Quagga mussels) • Competition with native vegetation (*Arundo donax*)	• *Arundo donax* eradication • Prohibit introduction of game fish in Lower River	• *Arundo donax* eradication (beginning in upper watershed • Continue Quagga mussels eradication efforts in Casitas Lake
Loss of estuarine habitat	• Loss of habitat for juveniles and lagoon-anadromous individuals	• Expand Ventura River estuary	---
Stocking of hatchery reared non-native steelhead and other fish	• Inbreeding depression • Predation • Disease	• Prohibit introduction of hatchery reared non-native steelhead trout	• Prohibit introduction of hatchery reared non-native steelhead trout • Consider elimination of introduced game fish from Casitas Lake
Other threats:			
Overfishing	• Steelhead trout population decline	• Continue prohibition on steelhead fishing in Lower Ventura River	• Continue prohibition on steelhead trout fishing in watershed

FIGURE 7.13 *Steelhead trout recovery: threats and recommendations.*

Cultural Element

This element focuses on meeting objectives related to the relationship between people and the Ventura River. Major objectives for this element are improving access and recreational opportunities at the River, increasing awareness of the river through formal and informal educational opportunities, encouraging stewardship, and minimizing land uses that would be incompatible with the overall objectives of the parkway. The circulation of visitors through the parkway is a major component of improved access; that subject is discussed in greater detail in Chapter 8, Circulation.

Bringing People to the River

Improved public access and riverside recreation are two important purposes of river parkway development under the California River Parkways Act (2004). Currently, convenient approaches to the Lower Ventura River within the proposed parkway area exist only at Foster Park and at the river mouth. This is due primarily to man made factors such as private property, a lack of public easements, and the barriers presented by Highway 33 and the Army Corps levee. However, lack of access is also attributable in part to natural factors such as dense riverside vegetation and changeable river channels that would defy many visitors' images of a quiet streamside walk. The following chapters of this Vision Plan present ideas for addressing these difficulties.

The river that lies at the core of the proposed parkway is an invaluable natural and recreational resource. This plan emphasizes the enjoyment and protection of that resource through passive recreational activities such as walking, hiking, biking, nature viewing, and education. Features that promote these activities, discussed in Chapters 9 through 12, include safe and legal access points for close observation and enjoyment of the Ventura River, places where people can gather near the river for picnics or other activities, places that focus visitors' attention on the historical richness of the area, and places that focus visitors' attention on current and future efforts to remediate the hydrological systems and ecosystems of the area.

Entry points are important places for visitors to become aware of the existence of the proposed parkway and the river and the activities and facilities available. Foster Park at the north end of the parkway corridor, and downtown Ventura and the river mouth at the south end, are natural entry points for travellers on the major roads in the area, and Chapters 9 and 12 give attention to informational facilities for orienting visitors at these locations.

Wayfinding features such as path alignments, signs and trail markers shown in the following chapters are important for suggesting the existence of destinations and activities that visitors might otherwise miss, and helping them get there with minimal disturbance to natural systems. These features can enhance the experience of visitors by suggesting that they are safe and will not get lost, but they can also show users when a location might be unsafe or an activity damaging to the environment. At the same time that they perform all of these functions, these features need to suggest many crossroads and many open choices, so that there is some adventure in every visit.

Balancing Visitor Access with Ecosystem Protection

Implicit in the objective of improving visitor access is the priority that improved access must not significantly impair the health of sensitive river ecosystems. The impacts of visitors can include the trampling of fragile vegetation, the erosion of soils, water and air pollution, and the disruption of wildlife. These impacts, as well as those of congestion and the deterioration of the aesthetic qualities of a landscape, can also lower the quality of the visitor experience itself (Manning 2007).

To some extent, existing difficulties for people in approaching the Ventura River might be seen as factors that have protected the sensitive natural ecosystems along the lower river from human disturbance and left the Ventura River as "one of the very few watercourses left in southern California that bear any semblance to pre-settlement conditions" (Hunt 1994). In fact, they were one factor leading a conservation biologist to recommend in the 1990's that the Ventura River bike and pedestrian trail be routed away from the river, on the east side of the levee. They are also likely factors influencing the county's policy of discouraging camping in the floodplain and estuary.

However, the isolation of the river from the city that lies just a short walk away also has serious costs. For Ventura citizens, ignorance of the river next door can lead to a lack of stewardship and a lack of awareness regarding the steps that should be taken to protect the ecosystem services provided by the river — *out of sight, out of mind*. The result is that vandals, polluters, and unauthorized campers have access to the river (and an impact on its health) while potential stewards among the public do not have access. In this respect, increased public access under appropriate circumstances should be seen as a factor that would enhance stewardship and protection for the river's ecosystems.

The general approach advocated in this Vision Plan, then, is a balancing of ecosystem protection and visitor access that advances both of these objectives without significantly compromising either. While a perfect balance may be unattainable, methods for systematically approaching this goal are available. For an example of a popular method and its application to the proposed parkway, see "The National Parks Experience" in this chapter.

Strategies for balancing visitor access with ecosystem protection that are discussed elsewhere in this Vision Plan include:

- Designation of the west side of the river as primarily natural and undeveloped in character with limited visitor facilities that reinforce that designation
- Continuance of the Ventura River Trail (which is primarily used by cyclists) on the east side of the levee and highway rather than closer to the floodway itself
- Creation of walking trails with different levels of facility, some of them ephemeral, in order to avoid overcrowding of especially sensitive areas
- Limitation of vehicle access and parking facilities in sensitive areas
- Signage and interpretive materials that emphasize the sensitivity of river ecosystems and encourage appropriate visitor behavior
- Stewardship programs, including docents, trail guides and river quality monitoring that are designed to encourage the consistent presence throughout the parkway of concerned individuals.

BUILDING STEWARDSHIP

Stewardship -- "Actions taken to maintain, restore and improve one's community, the landscape, and larger ecosystems" (Hester 2006) is the most important reason for designing improved public access to the Ventura River. Given the adjacency of the Lower Ventura River to an urban population, people will inevitably have an impact, for better or worse, on the river and its associated ecosystems. Stewardship -- a process through which humans interact with their environment in a positive, nurturing way -- should be seen as a prerequisite for the sustainability of the river.

Stewardship is reciprocal in the sense that people who serve their community and the ecology of their landscape also receive rewards that include experience as well as recognition, and this reciprocity is what makes stewardship impelling to Americans in spite of the sacrifices involved in giving service (Hester 2006). Engagement in stewardship changes individuals by directing their attention outside the inner circle of the self, into an ever-expanding world of awareness and concern about their neighborhoods, cities, watersheds, and finally, the vast ecological web of the landscape itself (Noss 1994) (Figure 7.17).

In his book *Design for Ecological Democracy* (2006), Randolph Hester imagines an future in which ecological concern and democracy become inseparable components in the urban planning process:

> *Direct democracy enlivens ecology with local wisdom and overcomes the alienation, anomie, and bleakness*

FIGURE 7.14 *Looking north from the Main Street Bridge.*

AN ABUNDANCE OF RICHES: TAKING ADVANTAGE OF VIEWSHEDS IN THE PARKWAY CORRIDOR

> *A view is an impeller: A powerful magnet, it will draw one far, and from one position to another, for the opportunity of better commanding its limits or seeing some part in a new and intriguing way (Simonds 1997).*

Siting decisions regarding trails, paths and resting areas in the following chapters attempt to take advantage of the abundant viewshed resources that are present in the proposed parkway area. Here are a few examples:

- The view into the upper watershed from the Casitas Vista Bridge at Foster Park (Chapter 9)
- Meandering river channels tightly framed by bluffs to the west as seen from the Cañada Confluence or the trail to Cottonwood Junction (Chapters 10, 11)
- The wide-open expanse of the Downtown Delta gradually narrowing into the middle watershed as the river passes north through farms and urban neighborhoods, as seen from the Main Street Bridge (Chapter 12).

ACHIEVING A BALANCE BETWEEN VISITOR ACCESS AND ECOSYSTEM PROTECTION: THE NATIONAL PARKS EXPERIENCE

With over 250 million visitors per year and responsibility over sensitive landscapes that are nearly sacred in the eyes of many, the U.S. national parks may be an ideal place for "pulling out all the stops" in an attempt to achieve a balance between visitor access and ecosystem protection. For nearly twenty years, the National Parks Service (NPS) has systematically studied the management issue of *social* carrying capacity — the level and type of recreation use that can be accommodated in a park without violating defined standards for both resource protection and a quality visitor experience. One result of the NPS experience is its Visitor Experience and Resource Protection (VERP) framework for the development of carrying capacity plans. The framework is currently being incorporated throughout the park system and has already been applied at more than twenty locations within the system (Manning 2007).

The VERP framework is based on the principle that the requirements of ecosystem protection and the desires of visitors are not necessarily in conflict, and that limitation of visitor access need not be the underlying intent in management policies to protect park resources. The key is to identify the factors that provide a quality experience as defined by visitors themselves, and then match those factors with the requirements of resource protection in order to pursue both priorities. For example, studies have disclosed that wilderness visitors tend to prefer encounters with five or fewer other groups per day (Manning 2007). This visitor preference for a quiet, uncrowded wilderness experience is consistent with the priority of avoiding excessive impacts on park resources, and can be satisfied through management policies such as structuring visitor facilities to avoid overcrowding. The VERP framework is applied by identifying visitor preferences through surveys or other means, defining park management objectives (often called *desired conditions*) that encompass both the quality of visitor experience and ecosystem protection, and then developing related and measurable *indicators* and *standards* for maintaining those desired conditions. Ultimately, management actions for achieving the identified standards are not limited to those that restrict visitor activities; in many cases, ecosystem protection is enhanced through the *expansion* of areas available to visitors or through programs to educate visitors about minimizing their impacts on the environment (Manning 2007). This process is illustrated in Figure 7.16.

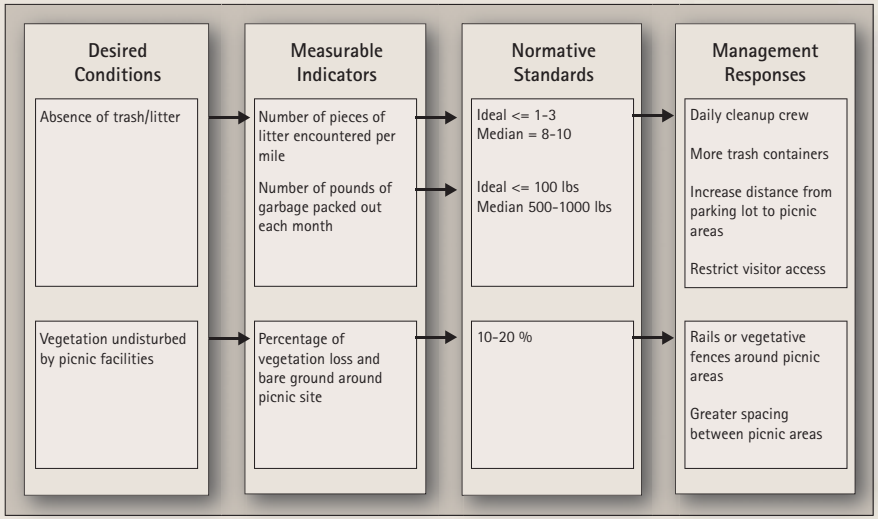


FIGURE 7.15 *An example of the application of the VERP framework to several desired parkway conditions.*

> *that some see in a world of severe limits. Hands-on participation shows ecology how to recultivate fallow community and environmental caring. . . . Direct democracy provides the forum through which ecological thinking becomes part of daily life and decision making. (Hester 2006)*

In this view, spaces are not only designed *with* input derived from public participation in the planning process; they are also designed *for* the encouragement of public participation that continues in the form of stewardship. This Plan recommends six main strategies for promoting continuing stewardship for the Ventura River and its environs:

- Bringing people closer to the river through improved access and circulation
- Finding opportunities for people to participate in the construction of the parkway
- Educating people regarding the river and its environs
- Involving people in a continuing relationship with the environment through activities that focus on monitoring environmental conditions
- Creating a local floodplain school as a nexus for many of these activities
- Seeking funding for professional stewards with appropriate training and expertise who can recruit, support and supervise volunteer stewards and ensure that their activities are sensitive to ecological concerns.

Building the Parkway with People

While charrettes and community input workshops are frequently employed in landscape planning processes, public participation in the construction of large landscape projects may be far less common. Community members could participate in the building of the parkway. For example, local seed collection and propagation would provide a safe, supervised context for the presence of volunteers in and around the river floodway and would result in a supply of

native plant material for parkway restoration – plants that are best adapted to climate conditions and the needs of local ecosystems.

Education for Stewardship

Another strategy for promoting stewardship is to recognize that the primary purpose of interpretation – efforts to orient and educate visitors to the proposed parkway – is to build public support for the river environment, rather than merely making for an interesting visitor experience. An observation platform at the river's edge (Chapter 10) can provide a pleasant view of the water. However, with appropriate interpretive materials, the same observation point can make visitors aware that their own efforts to conserve household water can help to increase the flow of water in the river, and that the floodplain and its active flooding processes need to be preserved.

People Monitoring the Parkway

As a third strategy, this plan recommends an emphasis on planning programs that will involve the public in the continuing preservation and enhancement of the environments in and around the proposed parkway area. One appropriate focus for these programs would be the monitoring of the environment. A multi-generational effort to restore large areas of the lower watershed will require an enormous body of data regarding the existing flora, fauna and hydrological conditions of the area as well as numerous observations regarding the continuing effects of restoration activities on those features. One existing local program, the Ventura Stream Team (see inset), shows how members of the public can contribute scientifically-valid observations with professional training and supervision, while having a great time doing it. In a similar vein, future volunteers could photograph evolving erosion and sediment conditions along the river, record animal sightings, or map the distribution of invasive plant species in support of eradication efforts.

Passive recreation in undeveloped areas is pleasant and rewarding for its own sake, but many hikers are aware that an additional element of joy comes with having a mission to fulfill in approaching the undeveloped lands. Proper planning and supervision of monitoring activities could result in a greater number of people safely and sensitively approaching the Ventura River and constituting a consistent presence there. Their mere presence would passively discourage vandalism, poaching or other harmful activities, while increasing the perception of safety for all parkway visitors.

A Floodplain School

Less than ten feet underneath every school building on the Westside of Ventura, water percolates through groundwater basins, moving toward the Ventura River and eventually, toward the Southern California bight. How many students in these schools are aware that they live and study in a floodplain? A fourth strategy for building stewardship would be a river-friendly floodplain school, a home base that would reinforce the other three strategies of parkway-building, education and monitoring. A Westside school could be enhanced with curricula in the humanities, arts, and sciences sharing a focus on watershed processes and watershed restoration. Reading classes could include Aldo Leopold's *A Sand County Almanac* and other classics in environmental literature. Arts workshops could enlist North Avenue artists who are increasingly producing work that addresses both the history and the future of the river. A school cross-country team could use parkway trails for training, while a chemistry class could test the quality of groundwater samples. If the program is established at an elementary school, students from a nearby high school would receive extra credit for visiting and supervising similar activities after school. Conversely, if the program has a high school as its base, local elementary students would frequently visit for the same activities. Using the school as a base for community meetings to plan the parkway and for the organization of volunteer programs for adults and youth would strengthen community ties in two ways -- first of all, by involving all ages together in the restoration of the lower watershed and second, by strengthening the relationship between civic activities and their sense of place.

ONE STEWARDSHIP MODEL: THE RIVER GUARDIANS

Efforts to improve Ventura River water quality have benefited uniquely from the work of volunteer stewards. Each month since January 2001, the Ventura Stream Team, a joint effort of the Santa Barbara Channelkeeper organization and the Surfrider Foundation Ventura Chapter, has trained and organized students, local residents and environmental activists and sent them knee-deep into the river and its tributaries to sample water quality and report on the results. The Team collects data on eight critical quality measurements at fourteen sites from the lowest freshwater reach of the river to streams above Matilija Dam (Santa Barbara Channelkeeper and Surfrider Foundation 2006).

In January 2006, The Stream Team published the results of six years of testing in a comprehensive and understandable guide to water quality for all of Ventura's residents – the report, and information about volunteering, are at http://www.stream-team.org.

FIGURE 7.16 *Ventura Stream Team. Photo: Surfrider Foundation 2008.*

PROMOTING ENVIRONMENTAL JUSTICE

Issues of environmental justice arise when the benefits of a healthy landscape, including open space and recreational opportunities, are unevenly distributed across different socioeconomic groups. Chapter 5 describes the relative lack of accessible public park space for residents of Ventura's Westside, a community that includes a large proportion of Hispanic and low-and-moderate income families. This Plan seeks to address this inequity by improving circulation and mitigating the physical barriers that stand between this neighborhood and the proposed river parkway, and by addressing access to the river from Westpark (chapter 12).

Issues of environmental justice also arise when the detriments of an unhealthy landscape impact disproportionately upon historically disadvantaged neighborhoods. Again, the Westside of Ventura appears to contain a disproportionately high number of brownfield sites with demonstrated or actual contamination arising from past industrial activities. One illustration of an approach for addressing this concern appears in the discussion of a prominent Westside brownfield site in Chapter 10, Canada Confluence.

MINIMIZING INCOMPATIBLE LAND USES NEAR THE RIVER

Chapter Three discussed the concept that a river is an integrated system of a constantly changing wet channel (or channels) and an adjacent floodplain, that is, the area beyond the river channel that may be intermittently flooded. Determining the exact boundaries of an existing floodplain is difficult since an unimpeded floodplain slowly but continuously changes in response to changes in river flow, sedimentation and topography due to both natural and man made causes. Nevertheless, based on visible topography it is reasonable to assume that the landscape encompassed by the proposed Lower Ventura River Parkway lies entirely within the present or historical floodplain of the river. Any discussion of land use policies for the parkway area should occur within the context of responsible and sustainable floodplain management.

Developments in the Ventura River floodplain that warrant a brief discussion within the context of this Vision Plan are industry, agriculture, and housing or mixed-use housing and commercial. An additional existing landuse that deserves discussion is the practice of casual or unauthorized camping primarily by homeless individuals, that occurs within the floodway of the river itself.

Two Visions for the Floodplain

A specific land use plan for the Lower Ventura River floodplain, beyond the proposed river parkway, is beyond the scope of this document. However, it is useful to imagine two starkly differing pictures of a future Lower Ventura River floodplain; both visions include human land uses in the floodplain, and both involve the need for the mitigation of risks to life and property from occasional high velocity floods.

In one vision, a traditional model based upon Twentieth Century practices, an unbroken cycle occurs: flooding leads to loss of life or property damage, governmental disaster relief, and large structural flood control projects such as concrete channels and levees. These efforts and the perception of flood protection that they create lead to increased floodplain encroachment and development. Despite the construction of flood "control" measures, future floods cause even greater economic losses due to the higher density of development, leading to still more structural flood "control" projects in a seemingly unending cycle (Riley 1998; Water Resources Council 1979). Under this regime, average annual flood damages (adjusted for population growth and inflation) actually increased -- more than twofold -- following this nation's era of massive flood control projects (Riley 1998).

Under another vision, the one recommended by this Plan, limited development continues in the floodplain within a context of non structural flood protection measures including land-use planning and regulation for a mixture of development and open space, stream restoration, emergency flood warning systems, relocation of structures from hazard areas, architectural designs that raise buildings above the floodplain or incorporate flood walls, and environmentally sensitive snagging and clearing projects. These measures, pioneered by the Tennessee Valley Authority in the 1950s, are increasingly being advocated by the United States Army Corps of Engineers, despite a federal funding structure that remains strongly biased in favor of structural concrete flood control projects (Riley 1998). What all of these approaches have in common is that they serve a multi-objective planning strategy in which measures that may be necessary for flood mitigation also serve other purposes such as ecosystem restoration. Following are five land use issues where this approach may have implications for the management of the floodplain of the Lower Ventura River.

The Value of Open Space

Open space should be a priority land use for the floodplain surrounding the proposed parkway. Vegetated open space is an example of a land use that serves multiple floodplain management objectives. It minimizes damage from occasional floods through the absence of structures that would otherwise incur damage, while the availability of land for the spreading out of flood waters reduces flood velocity and damage downstream. At the same time, this land use provides a resource for public recreation while providing ecosystem services that include water storage and purification, reduction of the urban heat island effect, habitat for flora and fauna (including species that pollinate local crops) and sequestration of carbon that would otherwise enter the atmosphere and hasten global warming.

Ecosystem services have economic value that has been estimated at 33 trillion dollars per year worldwide (McKibben 2007), and there is a point in any landscape where the cost to society of displacing ecosystems begins to exceed the value of the man-made wealth produced by that displacement (Daly and Farley 2004). While it may not be possible to accurately determine this balance in monetary

displacement (Daly and Farley 2004). While it may not be possible to accurately determine this balance in monetary terms, there is a clear implication that open space is not merely vacant space in between economically valuable lands.

Minimizing Heavy Industry

During the past century, the floodplain has seen industrial uses including oil drilling, storage and refining, chemical production and storage, and riverbed mining. These uses have had economic benefits such as job and tax generation that continue to the present, and they have formed part of Ventura's cultural heritage. However, heavy industrial uses also present serious challenges for a successful parkway project in a floodplain. Large, heavy industrial infrastructure is unlikely to be compatible with even shallow, infrequent flooding, and facilities close to the river present a constant risk of toxic spills as well as groundwater contamination in this area where shallow aquifers lay adjacent to the river.

Petroleum extraction continues in the proposed parkway area and has a direct economic impact on the region that will continue for an indeterminate number of years. However, in considering the effects of this industry and other floodplain management and ecological objectives, it is reasonable to foresee the gradual conversion of this land use over several decades to come; the oil resource will not last forever and the lifecycle costs of extraction may exceed the economic benefits of extraction long before all of the oil has been removed from the area (Chen et al 2007).

Preservation of Agriculture

This vision plan encourages the preservation and expansion of agricultural production in and around the proposed parkway area, and includes (in Chapter 10) an illustration of a land use model consisting of restored river corridors buffered by agricultural land, transitioning into residential tracts. Agriculture, like recreational open space and undeveloped lands, is ideal for multi-objective floodplain management. Many farms can be compatible with occasional flooding and most farms provide some moderate ecosystem support (e.g. small animal cover on their edges) while also presenting opportunities for the involvement of visitors.

Sensitive Residential Development

Existing and planned residential developments in the floodplain also have both beneficial and potentially harmful aspects from the standpoint of parkway objectives. Floodplain residential neighborhoods allow people to live in closer proximity to undeveloped lands with greater opportunities to benefit from contact with the undeveloped lands. Residential developments with attendant commercial spaces also provide jobs and tax revenue. Designed and built with Low Impact Development practices described elsewhere in this Plan, they can be compatible with ecosystems related to the river.

However, floodplain residential developments also have the potential to devour all open space outside of the floodway itself, for the simple reason that according to traditional economics, they have economic benefits that are easy to measure. To some extent, these economic benefits can be illusory. Developers traditionally stress the jobs, construction related service revenue, and tax base provided by developments without including the costs of taxpayer-funded infrastructure and displacement of ecosystem services. Simply stated, residential development in the floodplain is incompatible with parkway goals only if there is too much of it.

The recommendation here is to balance the tendency toward floodplain development with a recognition that undeveloped lands, agriculture, and open space are more geographically appropriate floodplain uses with at least equal economic benefits.

Mitigating the Impacts of Human River Dwellers

Chapter Five discusses the fact that, while members of the general public have little access to the Lower Ventura River, a number of individuals, many or most of them homeless, actually live in the floodway of the river itself on either a short or long term basis, concentrated mostly in the area near the Main Street Bridge and in Seaside Wilderness Park near the estuary. Casual or unauthorized camping in along this stretch of the river is an historical land use reaching back at least to the "Hobo Jungle" period early in the Twentieth Century.

Casual or extra-legal camping in and adjacent to the floodway has negative impacts on river ecosystems that include fires, trampling of vegetation, predation of wildlife, trash and water pollution. It has negative impacts on potential parkway visitors reflected in the comments of community members who have reported that the presence of campers feels threatening to them. And, most importantly, the practice threatens the safety of the campers themselves, who face the risk of drowning in unpredictable but inevitable floods. Therefore, consistent with city and county policies, this Plan would discourage camping in the floodway. Any efforts to discourage an overnight presence in the floodway should be part of a broader effort to provide local alternatives to homelessness, discussed in Chapter 12, Downtown Delta.

Efforts to discourage overnight camping in the parkway are not a reason to ignore the historical presence of homeless individuals there. Interpretive exhibits should acknowledge the history of Hobo Jungle and educate visitors about the current efforts of the city and county to combat homelessness. As part of the parkway planning process, planners or volunteers should actively seek oral histories from individuals who have lived at the river in order to better inform the sense of this place that may be communicated to future visitors. Parkway planning processes should include the participation of city and county.

River parkways improve or protect the water quality in our rivers and streams.

California River Parkways Act of 2004
California Public Resources Code §5751(g)