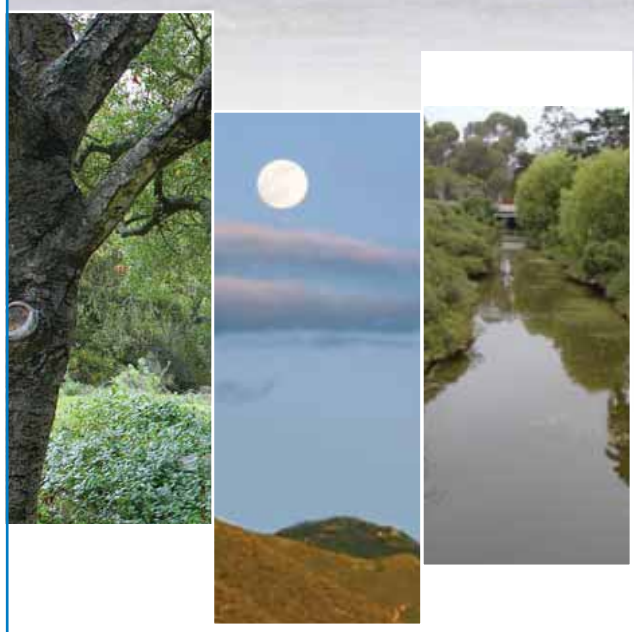
santa barbara's LIVING WATERSHEDS AND OCEAN

what's inside

A COMMUNITY GUIDE TO HEALTHY WATERSHEDS

clean beaches depend on healthy watersheds



The Creeks Division

The mission of the City of Santa Barbara Creeks Division is to improve the health and water quality of our creeks and the ocean. Our programs include reducing storm water pollution, restoring creeks and encouraging community participation and awareness. The Creeks Division is funded through grants and Measure B, which was passed by voters in 2000 and places a 2% tax on visitor stays in local hotels. Visit our website at www.sbcreeks.com.

The abundance of mountains, hills, natural areas, creeks and beaches contributes to Santa Barbara's reputation as one of the most beautiful areas in the world. As stewards of this environment, we all play an important role in preserving and enhancing our watersheds.

We all live in a watershed—land that is drained by a creek system that flows to the ocean. The health of our creeks and beaches is linked to the health of our watersheds. The purpose of this guide is to inform Santa Barbara residents about the state of our watersheds and to provide a foundation for developing action plans to improve our creeks and ocean water quality.

Our City

Santa Barbara is a relatively dense urban area, built mostly within the boundaries of four major watersheds. Neighborhoods edge up against streams and within floodplains. Creeks have been routed into man-made channels and underground pipes. Land that would otherwise retain and store water is paved over with streets, parking lots and buildings. This disrupts the normal meandering flow of water and the natural processes that would ordinarily filter rain water before it reaches the ocean.

The effects of urbanization have begun to show up on the beach and in the ocean. Beach warnings demonstrate that a healthy beach is linked to the quality of the water in the ocean—a direct result of the quality of the water that flows into it from land.

Santa Barbara now faces constant challenges to preserve and enhance water quality, and protect creeks and creekside habitat, floodplain areas, recreational corridors and beaches. An integrated look at our watersheds is revealing new opportunities to address these challenges.

Community Input

As a first step, in late 2004, the Creeks Division held a series of community forums. Hundreds of people offered their thoughts about the creeks and potential watershed goals and priorities. Key issues included trash, water quality, water management, habitat protection, recreation, public education, and how the community can help. Community priorities identified during the workshops are summarized on page 14. More detailed reports are posted on the Creeks Division web page at www.sbcreeks.com.

Scientific Input

Good science is key to understanding the relationships between natural systems and human land use decisions. Concurrent with the community workshops, the City commissioned a comprehensive study to establish a baseline for watershed health, management needs and opportunities for restoration. This study, *Watersheds Existing Conditions Report*, provides much of the scientific basis for setting watershed management priorities. To review the draft report, go to www.sbcreeks.com.

Next Steps–You Can Help!

The next step is developing Watershed Action Plans to guide coordinated improvements within the watersheds. Your input is critical to the success of the plans—we invite you to help make decisions about how to manage and preserve our watersheds. (See the schedule on the back page.)

Did you know that urban runoff flows to storm drains and then directly to the creeks and ocean?

the santa barbara watersheds

...from the ridgetops... through the city... to the ocean...

Santa Barbara's four main watersheds run north/south from the top of the Santa Ynez Mountains, down through Los Padres National Forest, through county areas and the city, and out to the beaches and ocean. They include:

- Arroyo Burro on the west;
- Mission Creek through downtown;
- Sycamore Creek on the east; and
- Laguna Creek, nestled on the flats and now mostly below ground in pipes.

The mountainous areas on the south side of the Santa Ynez ridge represent the upper area of the watersheds. Mostly within the Los Padres National Forest, they remain natural open areas, although dirt roads have cut across some sensitive habitats and unstable soils are causing some erosion and sedimentation in the creeks.

The mountains then drop steeply down toward the foothills and middle watersheds. Because of this steepness, water flows downhill very quickly during periods of heavy rainfall.

Most of Santa Barbara is located within the lower floodplains which once included native riparian forests. Now home to more than 90,000 people, many areas of the city are developed with roads, parking lots, offices, shops and housing. These surfaces don't allow water to percolate down into the ground. Instead, water runs off at high speed into creeks, which can overflow and make flood conditions worse.

What Pollutes Creek Water?

Urban runoff flowing into creeks contains pollutants such as oil, pet waste, trash, fertilizers, pesticides, and landscape waste that are then carried out into the ocean.

the state of our watersheds

There are a number of factors that contribute to the health of our watersheds and healthy watersheds can balance both human and ecosystem needs. Some of these factors and potential solutions include:

1 Water Quality: Santa Barbara's creeks suffer a range of pollutants during storms and throughout the year. The primary pollutant is bacteria, which can come from a number of sources. Other pollutants include sediment, oil, trash, pesticides, soap residues, and landscape debris. Illegal dumping and littering occurs on a year-round basis, particularly in the lower sections of Mission, Sycamore and Laguna Creeks.

To better understand pollutant sources and develop solutions, the Creeks Division conducts creek and storm monitoring, and supports DNA source tracking research. Creek clean-ups remove trash on a weekly basis, and enforcement programs reduce illegal discharges.

2 Water Supply: Santa Barbara receives most of its drinking water from the Cachuma and Gibraltar Reservoirs. Extraction is balanced with conservation to reduce harmful effects on those watersheds. Programs to use more recycled water, expand native landscapes and reduce water use help conserve limited water resources and reduce polluted runoff.

3 Groundwater Management: The city receives about 10% of its water supply from deep sources of groundwater. Although this can vary, in drought years, groundwater is more important. There are also areas where groundwater is very near the surface and seeps into the creeks. Because it is near the surface, shallow groundwater is also vulnerable to urban pollution.

4 Creek Banks and Geomorphology: Many of the creek channels in Santa Barbara are unstable. Creeks naturally change through erosion and sedimentation, as well as from unstable soils and geology. Instability increases with urban development. Bank erosion leads to property losses and downstream pollution. Attempts to stabilize banks with structures such as walls, can further contribute to creek instability. Opportunities to stabilize creek banks may be best achieved on a neighborhood basis or by creek segments.

5 Hydrology and Flooding: Because of natural topography, urbanization and creek encroachment, the city has flooding problems primarily in the lower Mission, Laguna and Sycamore watersheds. Impervious or hard surfaces contribute to flooding because rain water cannot be absorbed.

The use of water detention systems, vegetated swales, and porous pavement may increase infiltration in some areas. Solutions to flooding problems on lower Mission Creek are underway, additional work to address flooding for Laguna and Sycamore Creeks is still needed. Solutions are difficult due to cost, narrow creek channels, and existing development.






Zones of Watershed Management

Our watersheds are managed by a number of local, state and federal governmental agencies that address different land, water, natural habitat and wildlife issues. Watershed Action Plans can help guide coordination among different agencies:

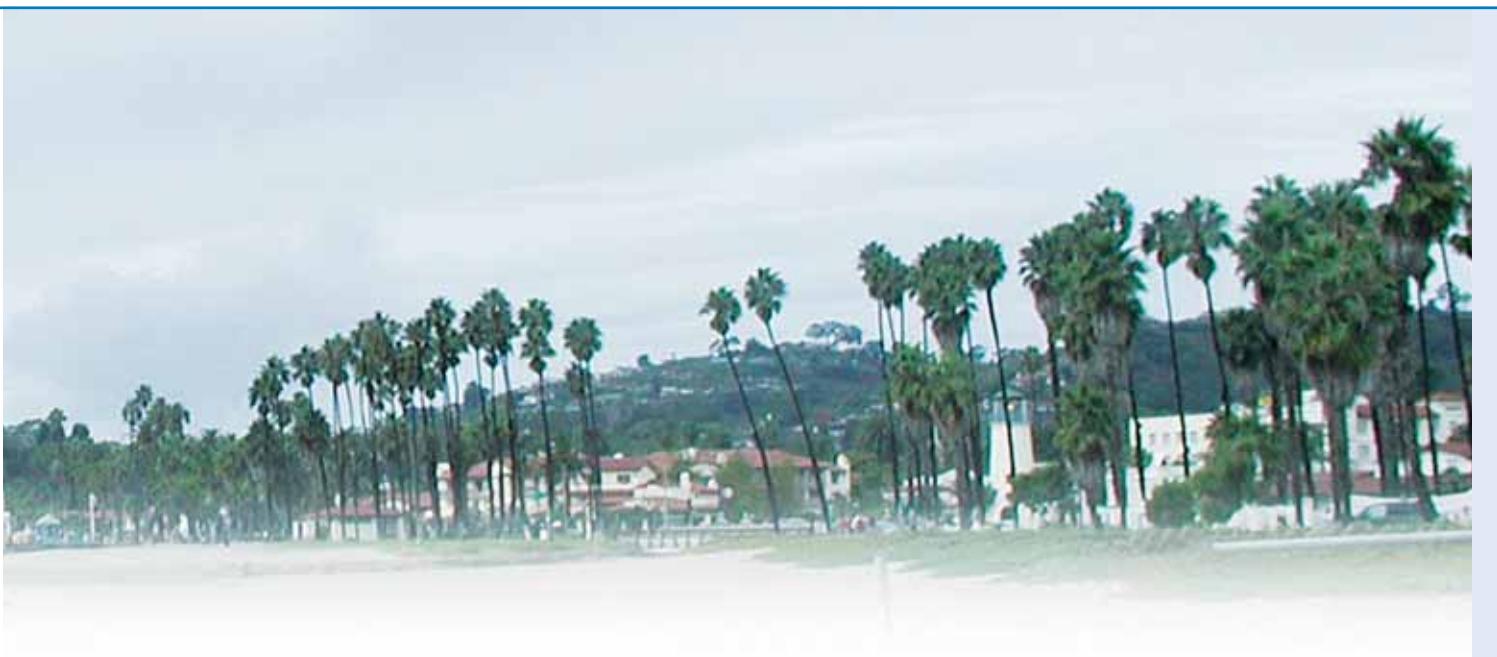
Upper Watersheds
- US Forest Service

Middle and Lower Watersheds
- County of Santa Barbara
- City of Santa Barbara
- California Department of Fish and Game

Coast and Ocean
- City of Santa Barbara
- California Coastal Commission
- State Lands Commission
- National Oceanic and Atmospheric Administration
- U.S. Fish and Wildlife Service

The Caltrans and the U.S. Army Corps of Engineers are also involved in many water and coastal issues.

Watershed Action Plans can help guide efforts across political and jurisdictional boundaries by creating a coordinated approach to addressing land, water, habitat, and urban development issues.



6 Land Use/Land Cover: Taken together, the four main watersheds comprise 17,663 acres of land. Of this land area, 51% is within the City of Santa Barbara, while 13% is unincorporated county land, and 36% is within the Los Padres National Forest. Within the city, over 50% of the land is for residential uses while 20% is for transportation. There are 1,764 acres of public open space. Guidelines for how land is developed can support healthy watersheds.

7 Storm Drain Infrastructure: Storm drains direct street runoff into the creeks. Most of Santa Barbara's storm drain system was designed when the city was smaller. Now some drains are too small to carry water from larger storms. Improvements to the storm drain system may alleviate street flooding in some areas.

8 Wastewater and Solid Waste: All commercial and most residential areas are connected to the sanitary sewer and wastewater is treated at the El Estero Wastewater Treatment facility. The City maintains the municipal collection pipes and is working with residents and community groups to develop a private sewer lateral maintenance program. Some residential areas with septic systems are being evaluated for municipal sewer service.

9 Forest Management and Fire Services: The U.S. Forest Service is responsible for forest management in Los Padres National Forest. The City's wildland fire plan addresses fire maintenance in hillside and other high fire hazard areas. Methods to balance habitat protection with vegetation management for fire protection can support healthy watersheds.

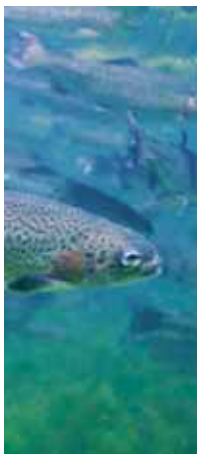
10 Terrestrial biology: Many native plant communities such as grasslands, oak woodlands, and coastal scrub have been lost due to agriculture and urban development. Upper watershed areas have healthy riparian creek corridors but the middle and lower areas are fragmented. The loss of native habitat has reduced wildlife diversity. Some wildlife corridors could be re-established, while others could be preserved.

11 Invasive Plants: Non-native plants such as arundo (giant reed), cape ivy and pampas grass crowd out native oak and sycamore trees, and other native plants. Invasive plants reduce habitat for wildlife, create fire hazards, and reduce the filtering capacity of creeks. Comprehensive invasive plant removal programs can help re-establish riparian areas, increase fire safety, and reduce creek bank erosion.

12 Fish Habitat: Santa Barbara creeks provide some habitat for the endangered southern steelhead trout, and its tidal lagoons are home to the endangered tidewater goby. However, 55 barriers (culverts, concrete channels) on Arroyo Burro, Mission and Sycamore Creek prevent steelhead from reaching upstream breeding grounds. Mission Creek offers the greatest potential for restoring steelhead habitat.





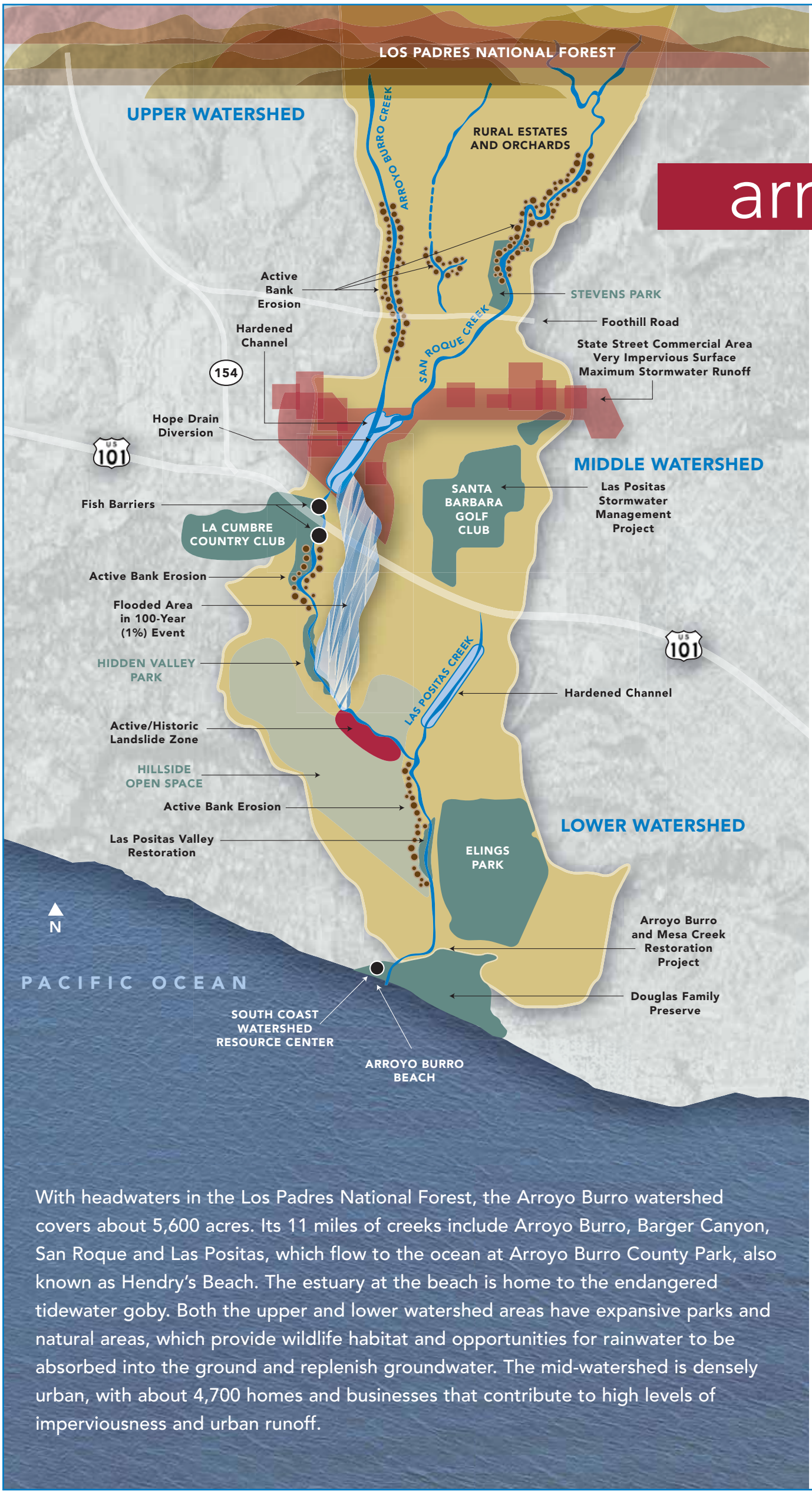



What Degrades a Watershed?

A healthy watershed can be degraded by various physical conditions or human activities such as:

- Large areas of impervious (paved) surfaces, reducing rainwater filtering and causing more runoff at faster speeds
- Creek bank and channel erosion increases sediment that harms aquatic life
- Leaking sewer lines or septic tanks, which can increase bacteria levels
- Littering and illegal dumping which pollutes creeks and the ocean
- Storm drain conditions that cause back ups and flooding
- Landslides due to unstable geology or human-induced instability
- Invasion of non-native species, which leads to loss of native habitat
- Loss of native landscapes which reduces wildlife diversity
- Lack of natural shade along creeks, which increases water temperatures
- Improperly graded dirt roads in natural areas cause erosion and sediment runoff
- Wildland fires lead to erosion and sedimentation
- Urban pollutants that are toxic to fish and birds and harmful to humans: oil and antifreeze from leaking cars, pet waste, fertilizers and pesticides, solvents, soaps and cleaners, and metals

arroyo burro



With headwaters in the Los Padres National Forest, the Arroyo Burro watershed covers about 5,600 acres. Its 11 miles of creeks include Arroyo Burro, Barger Canyon, San Roque and Las Positas, which flow to the ocean at Arroyo Burro County Park, also known as Hendry's Beach. The estuary at the beach is home to the endangered tidewater goby. Both the upper and lower watershed areas have expansive parks and natural areas, which provide wildlife habitat and opportunities for rainwater to be absorbed into the ground and replenish groundwater. The mid-watershed is densely urban, with about 4,700 homes and businesses that contribute to high levels of imperviousness and urban runoff.

CHARACTERISTICS

Governance

- Los Padres National Forest 45%
- City of Santa Barbara 45%
- County of Santa Barbara 10%

Land Use

- Residential 25%
- Commercial/Office 2%
- Open Space 73%

***Imperviousness** in Urban Areas (above 15% can lead to water quality and bank stabilization problems)*

- Upper Watershed 3%
- **Middle Watershed 23%**
- Lower Watershed 13%

State of the Watershed

The least urbanized of the four watersheds, the challenges in Arroyo Burro will be developing an integrated approach to creek bank stabilization in the upper and lower watershed, restoration of riparian and native plant communities, removal of non-native invasive plants, improving water quality, and removing fish barriers.

Water Quality: During the rainy season as well as in the dry season, Arroyo Burro Beach is often posted with water quality warnings about bacterial pollution. Sediment, landscape debris, trash, pet waste and household products (cleaners, pesticides and fertilizers) also pollute the creek. Pollutants enter the creeks at many of 119 storm drain outlets.

Active Bank Erosion: There is extensive bank erosion in the foothills and the lower watershed between Modoc Road and Cliff Drive. Foothill sources include new construction and agriculture. In lower Arroyo Burro, urban development, steep slopes, a narrow creek channel, and unstable geology contribute to erosion. Arroyo Burro also has active and historic landslide zones that contribute to creek instability and sedimentation.

Hardened Channels: Concrete revetments in natural streambeds are designed to reduce local flooding and erosion. Significant portions of the creek in the upper and middle watershed as well as Las Positas Creek have been modified with concrete, rocks and sandbags. Such modifications may reduce local erosion but can have downstream impacts, and often fail after a period of time.

Water quality improvement programs can help watershed health.

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Flooding: The Federal Emergency Management Agency (FEMA) has designated overflow channels for a 100-year-flood event (a flood having a 1% chance of occurring in any given year); there is an identified lack of flow capacity under Highway 101.

Terrestial Biology: The upper watershed in the Los Padres National Forest is dominated by natural plant communities and provides good habitat for wildlife. Riparian and other natural habitats are fragmented in the middle watershed due to agriculture, and residential and commercial development. The non-native invasive arundo (giant reed) is extensive in lower Arroyo Burro. Despite this, south of Veronica Springs there is a diversity of vegetation which supports a range of wildlife.

Fish Habitat: Although the Arroyo Burro Estuary provides habitat for the endangered tidewater goby, there are 18 barriers to steelhead migration in the watershed; with the two most significant below Highway 101. Historical accounts support the use of Arroyo Burro for steelhead migration when access was possible.

Parks and Open Space: There are 468 acres of public open space in the urbanized area of the watershed, including the Douglas Family Preserve, Hidden Valley Park, Elings Park, and Arroyo Burro Beach, among others. Open areas help absorb rainwater and can provide improved natural habitat and recreation opportunities.

SELECTED PROJECTS

Las Positas Stormwater Management Project: Will treat naturally many of the pollutants that collect on streets and residential neighborhoods using bioswales and detention basins at the Santa Barbara Golf Club.

Hope Avenue Storm Drain Diversion: Diverts polluted urban runoff from the storm drain to the sanitary sewer to improve water quality in Arroyo Burro.

Arroyo Burro Estuary Restoration: Scheduled for June 2006, the project will daylight Mesa Creek, expand the estuary, increase riparian habitat, reduce bank erosion, increase public access, and provide community education.

Las Positas Valley Restoration: Will remove arundo, increase riparian habitat, stabilize eroding creek banks, and improve water quality through natural filtration.

Santa Barbara County Weed Management Area: Removes invasive arundo plants in the lower watershed.

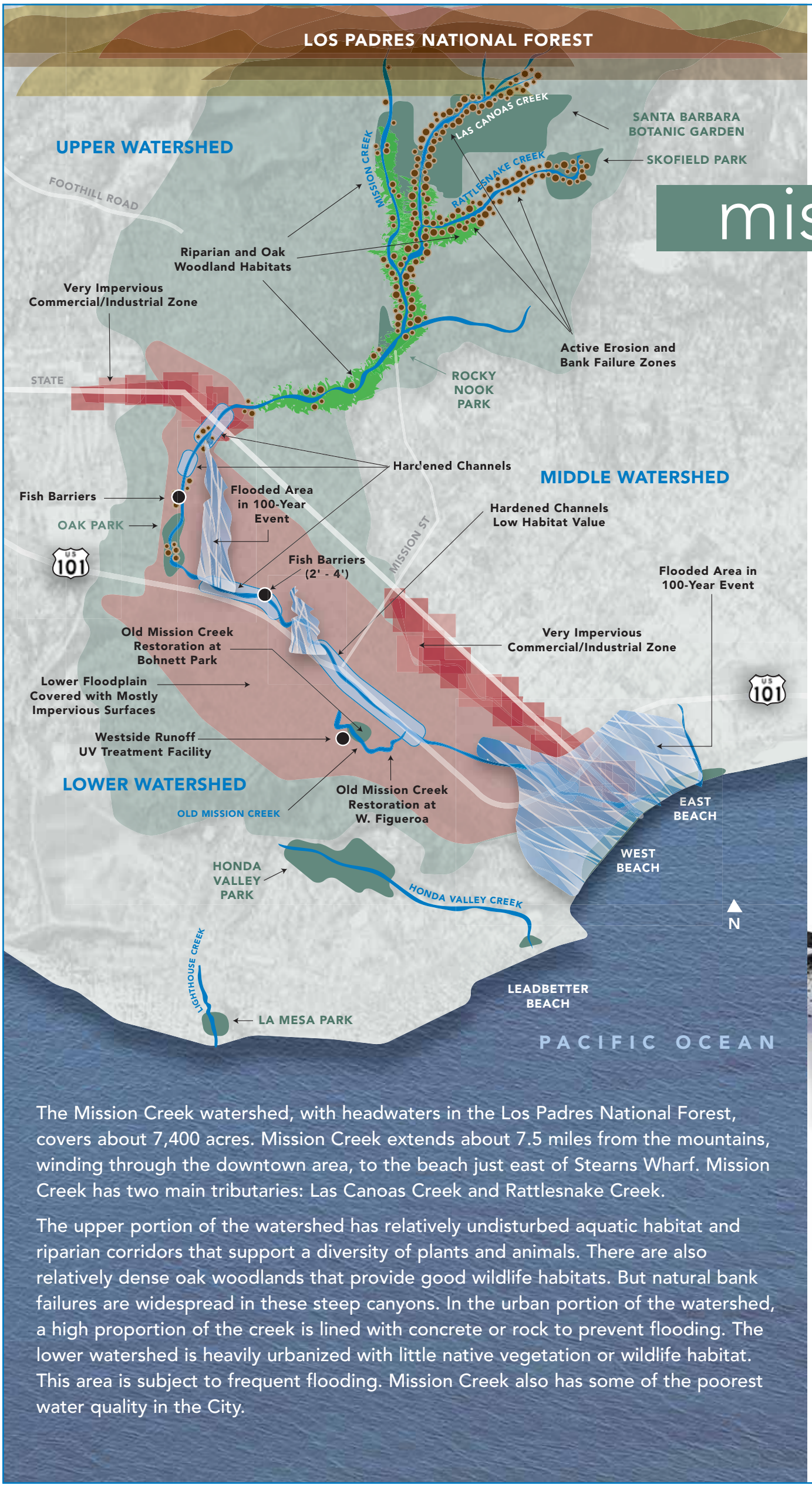
Strategies for Watershed Health

WATER QUALITY IMPROVEMENT

Based on scientific analysis and community priorities, there are eight primary water quality strategies for watershed health:

- Build watershed water quality enhancements on publicly owned land, similar to the Las Positas Storm Water Management Project.
- Address unpaved and eroding roads in Los Padres National Forest and unincorporated County lands, and develop measures to reduce sediment.
- Establish water quality guidelines for new development to treat storm water runoff, reduce creek bank erosion, and eliminate pollutants.
- Retrofit developed areas with vegetated swales, filters and pervious surfaces to reduce pollution and storm flows.
- Expand water quality monitoring through surveys and modeling to predict and measure sources of and transport of pollutants.
- Continue DNA water quality research to determine the extent and source of human and domestic animal fecal pollution.
- Work with private landowners to replace septic systems with municipal sewer service and establish a sewer lateral inspection program.
- Expand creek clean-ups and educate residents about sources of pollution.

mission creek



The Mission Creek watershed, with headwaters in the Los Padres National Forest, covers about 7,400 acres. Mission Creek extends about 7.5 miles from the mountains, winding through the downtown area, to the beach just east of Stearns Wharf. Mission Creek has two main tributaries: Las Canoas Creek and Rattlesnake Creek.

The upper portion of the watershed has relatively undisturbed aquatic habitat and riparian corridors that support a diversity of plants and animals. There are also relatively dense oak woodlands that provide good wildlife habitats. But natural bank failures are widespread in these steep canyons. In the urban portion of the watershed, a high proportion of the creek is lined with concrete or rock to prevent flooding. The lower watershed is heavily urbanized with little native vegetation or wildlife habitat. This area is subject to frequent flooding. Mission Creek also has some of the poorest water quality in the City.

CHARACTERISTICS

Governance

- Los Padres National Forest 44%
- City of Santa Barbara 41%
- County of Santa Barbara 15%

Land Use

- Residential 30%
- Commercial/Office 2%
- Open Space 68%

***Imperviousness** in Urban Areas (above 15% can lead to water quality and bank stabilization problems)*

- Upper Watershed 0.5%
- **Middle Watershed 21%**
- **Lower Watershed**
  - **Old Mission. 29%**
  - **Lower Mission 49%**

State of the Watershed

The challenges for the Mission Watershed will be to find innovative ways to reduce the amount of pavement and flooding, restore riparian areas in the lower watershed, reduce the sources of bacterial pollution, and remove fish barriers. Creating conditions suitable for steelhead, such as clean and cold water with adequate shade cover, would contribute to a healthier watershed.

Water Quality: Lower Mission Creek has the poorest water quality of all the creeks. Bacteria is present throughout the year and there are ongoing problems with other pollutants, trash and homeless encampments. The lack of natural stream bottom, wetlands, and riparian buffers, reduces the potential for the natural filtration of pollutants.

Habitat improvement programs can help watershed health.

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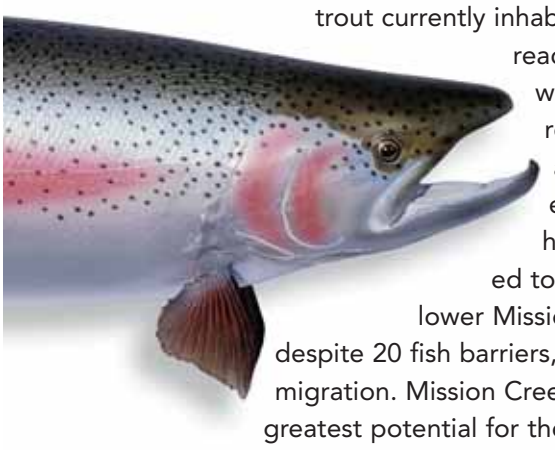
Flooding: FEMA has identified areas in the lower watershed as overflow zones for a 100-year-flood event. Historically, the areas above Highway 101 and the lowest reach have flooded most often.

Active Bank Erosion/Stabilization: In the upper watershed, 20-40% of the banks of Las Canoas and Rattlesnake Creeks are eroding and contributing sediment to the creeks. High flows and unstable banks create additional erosion in the middle reaches between Oak Park and the Caltrans concrete channel.

Hardened Channels: Significant portions of the banks of lower Mission Creek (from Pedregosa to Cabrillo Boulevard) have been hardened with concrete and rock to reduce erosion and provide flood protection. These areas are densely developed and have limited natural riparian vegetation and associated habitat.

Terrestial Biology: The upper watershed supports high quality native plant and wildlife habitat and oak woodlands are prevalent at Rocky Nook Park and Oak Park in the middle watershed. The lower watershed is largely devoid of native habitat and includes significant stands of non-native arundo (giant reed).

Fish Habitat: There are extensive historical records of southern steelhead in Mission Creek and rainbow trout currently inhabit the upper reaches of the watershed. In recent years, a few southern steelhead have attempted to spawn in lower Mission Creek, despite 20 fish barriers, that restrict migration. Mission Creek has the greatest potential for the restoration of steelhead. Marginal habitat for the endangered tidewater goby exists in the Mission Lagoon at East Beach.



Parks and Open Space: There are 16 parks that cover 578 acres in the urban watershed. The largest are in the upper reaches, including Rattlesnake Canyon, Santa Barbara Botanical Garden, and Rocky Nook Park. Open space is valuable because it can slow runoff and increase percolation.

SELECTED PROJECTS

Old Mission Creek at Bohnett Park: Completed in 2003, the City Creeks Division restored riparian habitat, improved water quality with bioswales, and enhanced open space in a dense neighborhood. It is now used as a learning laboratory for restoration strategies.

Old Mission Creek Storm Water Management at West Figueroa: Conceptual plans include constructing wetlands to treat storm water, reducing creek bank erosion, enhancing riparian habitat, and reducing illegal dumping.

Westside Summer Urban Runoff Facility: Scheduled for construction in spring 2006, the facility will use ultra violet light to eliminate microbes in summer runoff at the Westside Drain before water enters Old Mission Creek at Bohnett Park.

Haley Street Storm Drain Diversion: Diverts polluted urban runoff from the storm drain to the sanitary sewer to improve water quality in Mission Creek.

Natural History Museum: Fish passage enhancements and plans for riparian restoration along Mission Creek will demonstrate the use of native plants and permeable paving.

Mid-Mission Creek Restoration: Samarkand residents and the Creeks Division teamed up to clean-up and replant the banks of Mission Creek.

Lower Mission Creek Flood Control Project: Creek channel widening and native vegetation will reduce flooding, improve water quality, and provide improved habitat for southern steelhead.

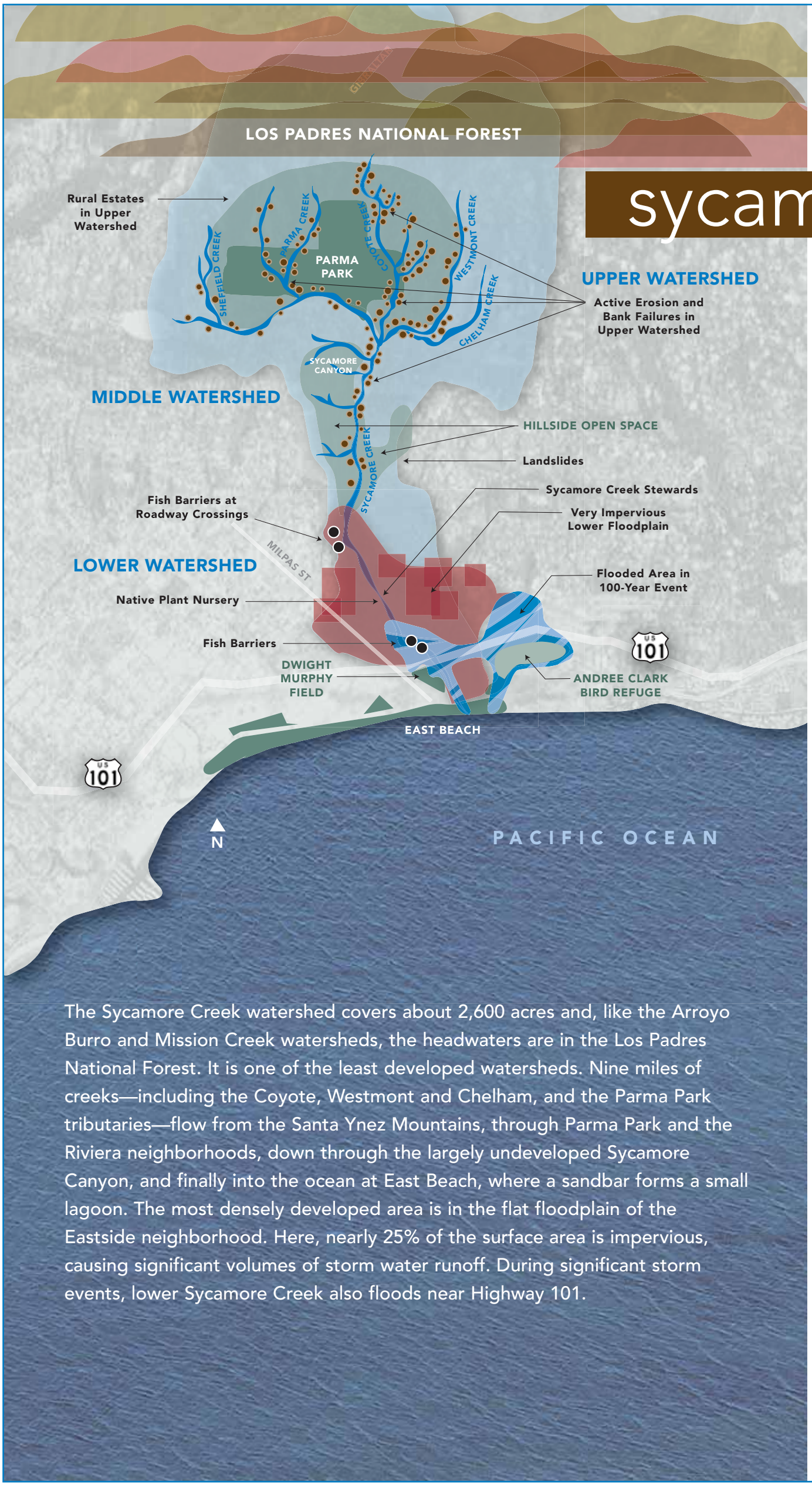
Strategies for Watershed Health

HABITAT IMPROVEMENT

Based on scientific analysis and community priorities, there are seven primary habitat improvement strategies for watershed health:

- Continue to implement creek restoration projects on public lands to demonstrate creek management and habitat restoration strategies.
- Develop a comprehensive watershed non-native plant removal program for invasive species such as arundo donax (giant reed), cape ivy and others.
- Expand local production of native trees, shrubs and grasses to ensure biodiversity.
- Continue to implement neighborhood creek steward projects where the City and residents work together to restore creek areas.
- Develop a technical assistance program to assist private landowners with habitat restoration projects.
- Revive the steelhead population by providing passages for fish to migrate upstream for spawning.
- Develop habitat restoration approaches after a fire has gone through a watershed.

sycamore creek



The Sycamore Creek watershed covers about 2,600 acres and, like the Arroyo Burro and Mission Creek watersheds, the headwaters are in the Los Padres National Forest. It is one of the least developed watersheds. Nine miles of creeks—including the Coyote, Westmont and Chelham, and the Parma Park tributaries—flow from the Santa Ynez Mountains, through Parma Park and the Riviera neighborhoods, down through the largely undeveloped Sycamore Canyon, and finally into the ocean at East Beach, where a sandbar forms a small lagoon. The most densely developed area is in the flat floodplain of the Eastside neighborhood. Here, nearly 25% of the surface area is impervious, causing significant volumes of storm water runoff. During significant storm events, lower Sycamore Creek also floods near Highway 101.

CHARACTERISTICS

Governance

- City of Santa Barbara 55%
- County of Santa Barbara 21%
- Los Padres National Forest 24%

Land Use

- Residential 23%
- Commercial/Office . . . . . <1%
- Open Space 77%

***Imperviousness** in Urban Areas (above 15% can lead to water quality and bank stabilization problems)*

- Upper Watershed 2%
- Middle Watershed 4%
- **Lower Watershed. 24.5%**

State of the Watershed

The key challenges in the Sycamore watershed include the need for an integrated approach to creek bank stabilization, strategies to reduce the impacts of floods, creek erosion and sedimentation, and programs to increase riparian areas and wildlife habitat.

Water Quality: Water quality in Sycamore Creek is better than the other creeks, although during storms there are high levels of sediment and bacteria. Littering and illegal dumping occur in the lower watershed on a year-round basis.

Flooding: The high percentage of imperviousness and the limited capacity of lower Sycamore Creek combine to cause flooding both upstream and downstream of Highway 101. When constricted, the middle section of the creek is also prone to flooding. Flood proofing techniques (raised structures, flood walls) could reduce damage from flooding.

Bank Erosion/Hardened Channels: Active bank erosion begins at Alameda Padre Serra (APS) and continues into the tributaries in the upper watershed. A comprehensive bank stabilization plan could help control bank erosion. Over 50% of the lower watershed has been channelized with hardened banks and contained in a narrow channel that cannot contain significant storm events.

Landslides: In the upper watershed, active and dormant landslides in the creek banks and hillsides have played a significant role in the

WATERSHED

evolution of the creek and the location of the creek channel. Erosion along steep slopes of the upper watershed and along Sycamore Canyon may be contributing to high sediment levels in the creek.

Terrestial Biology: The upper watershed has areas of open space and native vegetation interspersed with residential development. Habitat quality is lower than the Mission and Arroyo Burro watersheds and becomes marginal south of Stanwood to the ocean.

Fish Habitat: The endangered tidewater goby is found in the tidal lagoon and the upper watershed historically provided habitat for southern steelhead. However 17 fish barriers, erosion, and low summer flows limit the ability of Sycamore Creek to support steelhead.

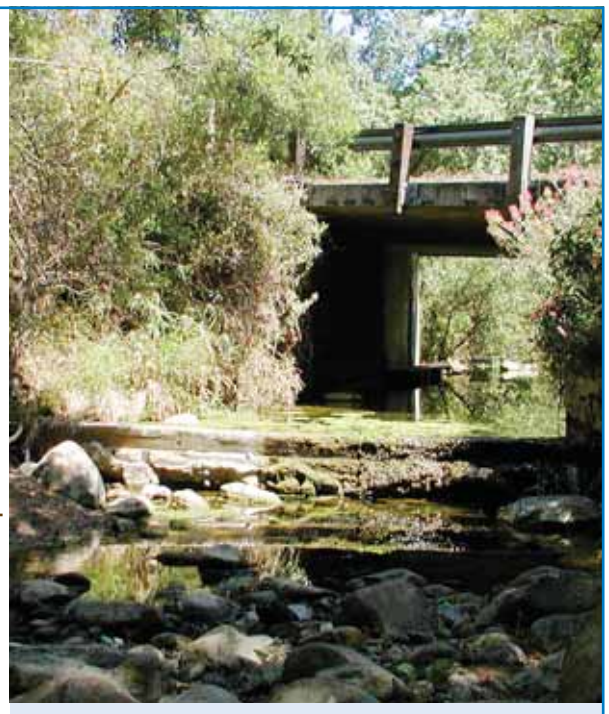
Parks and Open Space: Parma Park, a 200-acre natural area with vista points, extensive creekside habitats and abundant wildlife, is an excellent example of native watershed vegetation. The Park is entirely undeveloped, aside from hiking, walking and equestrian trails and a firebreak road. In the lower watershed, Dwight Murphy Field Park provides 10 acres of sports facilities, and the Andree Clark Bird Refuge and East Beach offer 55.5 acres of open space.

SELECTED PROJECTS

Native Plant Nursery: In 2002 the Creeks Division established a native plant nursery on Soledad Street. The nursery plays a key role in restoration by providing grasses, shrubs and trees collected from local seeds and plant cuttings for creek restoration projects.

Sycamore Creek Stewards: The Creeks Division, Santa Barbara Beautiful, Eastside neighbors and school children teamed up to clean up Sycamore Creek at Cacique, Liberty and Soledad. The project included creek clean-up, removal of non-native plants, installation of 1,400 native plants and mulching to reduce weeds.

Creek improvement programs can help watershed health.



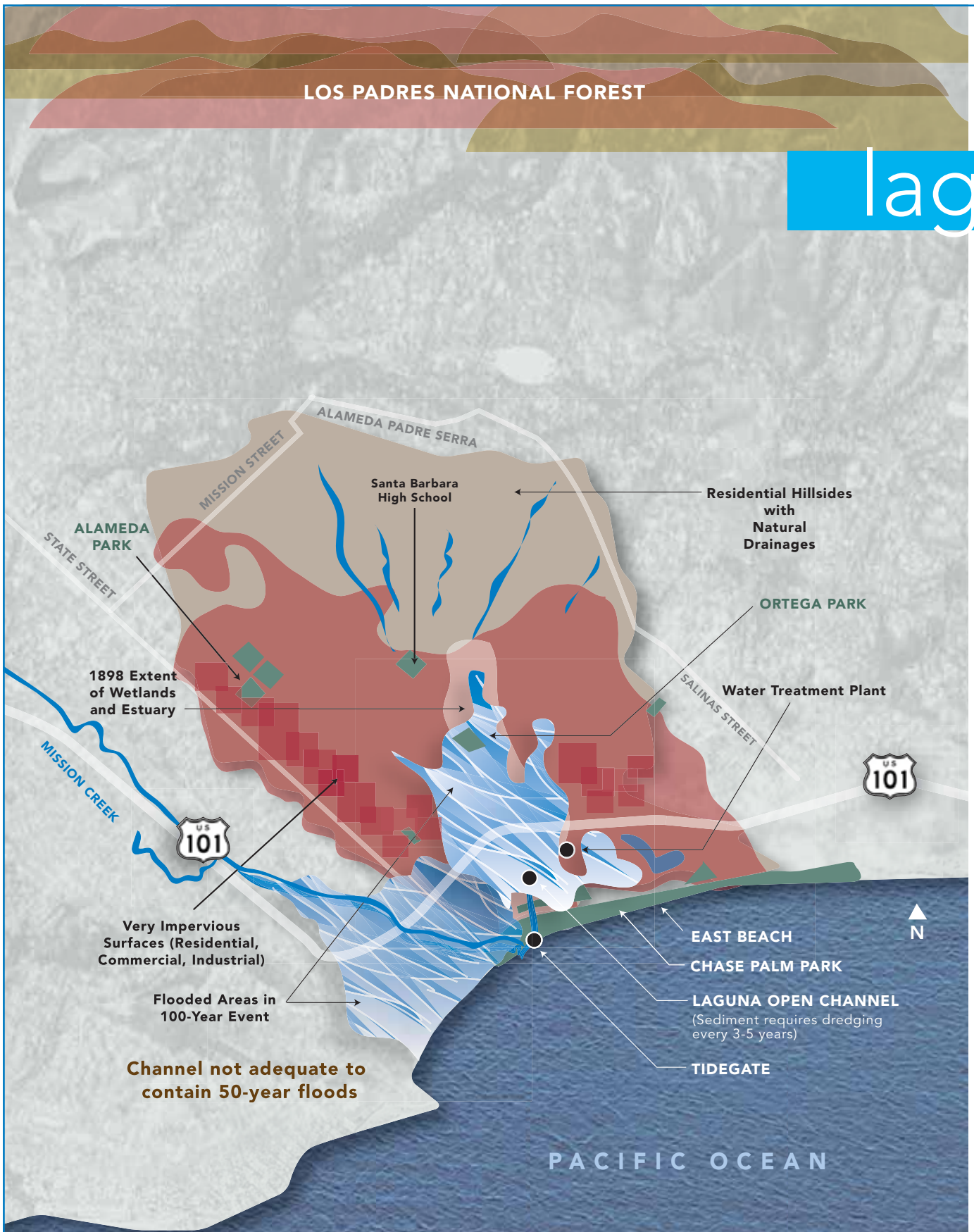
Strategies for Watershed Health

CREEK IMPROVEMENT PROGRAMS

Based on scientific analysis and community priorities, there are four major creek improvement strategies for watershed health:

- Identify opportunities to address stream bank stabilization issues on a collective neighborhood or creek-reach basis, rather than by the individual landowner. Creek bank conditions could be considered and incorporated into sets of neighborhood guidelines for creek channel stabilization. Participation in the program would be voluntary.
- For design and cost efficiency, bank repair could begin and end at stable points within a creek reach or segment. Improvement projects could incorporate habitat enhancement elements while minimizing local and downstream impacts.
- Evaluate opportunities for financial assistance. As an example, neighborhoods could consider formation of Geologic Hazard Abatement Districts (GHADs) to share costs for creek stabilization.
- Undertake watershed hydrologic modeling to help identify opportunities to resolve the long-term effects of increased storm water runoff and erosion. Evaluate opportunities such as on-site water detention, creek channel improvements, and the use of different techniques such as biotechnical stabilization to improve water quality.

laguna creek



The Laguna Creek Watershed once included the extensive El Estero estuary and freshwater marsh habitats that extended from the Pacific Ocean northward to Anapamu and Milpas Streets. Filled for development in the early 1990s, the watershed is now mostly invisible. South of Santa Barbara High School, Laguna Creek flows mainly beneath streets through culverts. The watershed covers about 2,020 acres of almost entirely urban land on the southeast side of Santa Barbara. Nearly the entire watershed is in City jurisdiction.

Runoff from the City's highly developed east side flows to the channel via underground storm drains. The lower portion, called the Laguna Channel, is a fabricated open channel that includes earthen and concrete banks. Managed by a pump station, Laguna Channel empties into a lagoon and then the ocean at the beach across from Chase Palm Park. The channel has a very low gradient and the upstream areas are prone to flooding.

CHARACTERISTICS

Governance

- City of Santa Barbara 98%

Land Use

- Residential 64%
- Commercial and Industrial 15%
- Open Space/Parks 22%

***Imperviousness** in Urban Areas (above 15% can lead to water quality and bank stabilization problems)*

Watershed . . . . . Nearly 40%

State of the Watershed

The major challenges for the Laguna watershed will be finding innovative methods of flood protection, improving water quality, and restoring the remnant areas of the creek and its wetlands. Reducing impervious surfaces will also be important since the downtown, commercial and industrial areas have extensive surface pavement, which results in more runoff.

Water Quality: Laguna Channel carries ground water, urban runoff and storm water to the ocean at East Beach. Water quality concerns include bacteria and other urban pollutants such as sediment, hydrocarbons, and pesticides.

Flooding: Flooding is a major concern in the watershed. Some flood flows break out from lower Mission Creek and the Laguna Channel is not adequate to contain a 50-year flood (a 2% chance of occurring). FEMA has designated large areas of the lower watershed as an overflow area during 50 and 100-year events. The channel is dredged every 2-3 years to remove sediment and increase flood capacity.

Underground Drainages: The historic estuary was filled to create land for development in the early 1900s. Now the flat areas of the former lower floodplain and estuary flow through underground pipes to the Laguna Channel, which is man made. Laguna Channel runs about 2/3 miles to the ocean.

Pumping Station and Tide Gate: Between Highway 101 and the pump station, the Laguna Channel is lower in elevation than the high tide elevation. The tidal gate dam prevents tidal flows from migrating upstream. Water is periodically pumped to the lagoon, to prevent water from backing up in the upstream channel.

Water management programs can help watershed health.

WATERSHED

Groundwater Recharge: The watershed's high level of imperviousness limits groundwater recharge. However, vacant upland and lower watershed areas could allow some water percolation into the Santa Barbara Groundwater Basin.

Parks and Open Space: Chase Palm Park, Alameda Park, Ortega Park, Mission Historical Park and 5 smaller parks provide a combined total of 65 acres of parklands.

Terrestrial Habitat: There are some remnant oak woodland and chaparral habitat in the foothills, but the watershed is largely urbanized. The Laguna Channel has very limited restoration potential, but it could be possible to replant the tidal lagoon and enhance tidewater goby habitat. Native plants have almost entirely disappeared; they comprise less than 5% of all riparian vegetation along the channel.

Fish Habitat: There is no significant fish habitat upstream of the tide gate. The gate prevents tidal water from flowing upstream, but also creates an impassable fish passage barrier. There is a small population of Southwestern pond turtles living in the channel and the Andree Clark Bird Refuge. The turtles are considered a threatened species in California; habitat improvements could continue to support the population.

SELECTED PROJECT

Re-vegetation of El Estero Wetland: The City of Santa Barbara is evaluating potential revegetation of a small section of wetlands that convey water into Laguna Channel. Next to the El Estero Waste Water Treatment Facility, the wetlands provide some habitat for the southwestern pond turtle.

Strategies for Watershed Health

WATER MANAGEMENT

Based on scientific analysis and community priorities, there are three water management strategies that could improve watershed health:

- Control runoff from existing large paved areas. Minimize storm water runoff by reducing paved areas and encouraging use of porous paving and onsite detention.
- Establish guidelines for low impact development so that new public and private projects can better reduce and treat potential sources of polluted urban runoff.
- Develop a watershed technical assistance program that includes incentives for residents and business owners to take a variety of actions including: flood proofing, parking lot filters, wash water containment, sustainable landscaping, creek restoration, fish habitat enhancement and fish passage barrier removals, among others.

Some Watershed Terms

Biotechnical stabilization: A creek bank stabilization method that uses trees, willows, natural rock and other plant-based materials (such as root waddles and brush mattresses) to stabilize eroding creek banks.

Erosion: The wearing away of bank slopes and removal of soil due to water flow.

Groundwater: Soil beneath the surface that is saturated with water (the open spaces between individual soil particles are filled with water).

Groundwater table: The depth at which water is found beneath the ground surface. In the lower elevations and the level floodplain areas of Santa Barbara, the groundwater is very close to the surface.

Habitat restoration: Restoring (by clearing, replanting or redesigning) a natural area to improve native plant and wildlife diversity and survival.

Imperviousness: Hard surfaces that do not allow water to be absorbed into the ground, such as roads, driveways, parking lots, and other paved areas.

Integrated pest management: Managing pests through a combination of natural and non-toxic chemical methods. For example, applying mulch to prevent weeds.

Non-point source water pollution: Pollution from sources that can't be specifically identified.

One Hundred Year Flood: A flood having a 1% chance of occurring in any given year (50-year floods have a 2% chance of occurring in any given year).

Riparian: The banks and land near freshwater streams, creeks and lakes. Plants and animals in these habitats are more dependent on water than organisms further away from the water. Native trees and shrubs which grow parallel to creek banks reduce erosion and provide shade and nutrients for fish and habitat for birds and other wildlife.

Steelhead: A trout that migrates into the ocean and returns to fresh water to spawn. Santa Barbara creeks are considered habitat for the endangered southern steelhead species.

community priorities

Late in 2004, the Creeks Division hosted three public forums to provide the community with an opportunity to help the City set watershed priorities. Nearly 200 people offered ideas and comments, focused on seven watershed management topics:

1. Clean Up and Trash Removal
More anti-litter campaigns and community clean up programs.

2. Improve Water Quality
Provide information and incentives for homeowners and businesses to reduce pesticide use, clean up after animals, and increase permeable surfaces.

3. Control Erosion and Sediment
Increase use of native plants that guard against erosion and find ways to partner with neighborhoods to repair stream banks.

4. Enhance Terrestrial and Aquatic Habitat
Provide education and incentives for using native plants, improving habitat for fish and improving degraded backyards and vacant lots.

5. Improve Water Management
Integrate land use planning with watershed management, encourage methods for increasing groundwater infiltration, and increase use of recycled water.

6. Preserve Natural/Recreation Areas
Convert creeks (where possible) into green corridors and create regional parking and transportation plans, more bike and pedestrian trails.

7. Increase Public Awareness
Provide more information to the community about what they can do and what the City is doing to improve creeks, watersheds and the beaches.

The City Creeks Division is proposing four potential improvement directions that incorporate the community priorities and could be applied to all watersheds. The improvements are outlined in the sidebars on pages 7, 9, 11 and 13. You can find all of the community priorities that were recorded at the meetings online at www.sbcreeks.com.

you can help!

The choices we make everyday, from disposing of chemicals to using pesticides, and even the plants we choose for our backyards, can improve the water quality in our creeks and the ocean. All the water running off our lawns, gardens, roofs, driveways, animal enclosures, roads and parking lots is directed—without any treatment—through storm drains (underground pipes) and open channels to the creeks and ocean. (This is separate from the sanitary sewer system, which collects wastewater from most households and commercial sources through indoor plumbing and treats it before discharge.)

Here are some things you and your neighbors can do right now to help ensure healthy creeks and watersheds.

Home Maintenance

- Never pour chemicals or other materials, including dirty water, down the storm drain!
- Minimize the use of chemicals in your house and garden
- Never drain spas, pools, waterbeds or other chlorinated water into the storm drain
- Use water-based paints and thinners and clean up indoors
- Recycle or properly dispose of household hazardous wastes such as paint, solvents, oil, auto fluids (www.sbrecycles.org or call 800-CLEAN-UP)
- Dispose of dirty, soapy water down the sink or toilet
- Remember, even bio-degradable soaps are toxic to fish

Landscaping and Yard Maintenance

- Compost yard and lawn clippings away from the creek
- Consider chemical-free lawn and garden care as a less toxic alternative
- Practice water conservation (go to www.sbwater.org for more information)
- Monitor irrigation system weekly, eliminate overspray and midday watering
- Reduce lawn areas
- Avoid using fertilizer or pesticides during the rainy season or on windy days and do not exceed the recommended amount
- Consider native plants, which provide food for birds and beneficial insects
- Native plants are locally adapted and will not need fertilizers or pesticides

Animal Access

- Establish a buffer zone between animal enclosures and creeks. Prevent manure contact with the creek
- Prevent dogs and cats from harassing or killing wildlife
- Clean up after your pets while at home and in the wild
- Dispose of pet waste in the trash

CALL FOR ADDITIONAL INFORMATION ON CITY PROGRAMS

Creeks Division (www.sbcreeks.com)

General information: 897-2658

Storm drain/creek pollution: 897-2688

Community outreach/education: 897-2606

Creek restoration: 897-1958

Integrated Pest Management: 564-5464

Recycling: 564-5587

Hazardous Waste Disposal: 564-5676

Water Conservation: 564-5460

Water Problems (broken mains): 564-5413

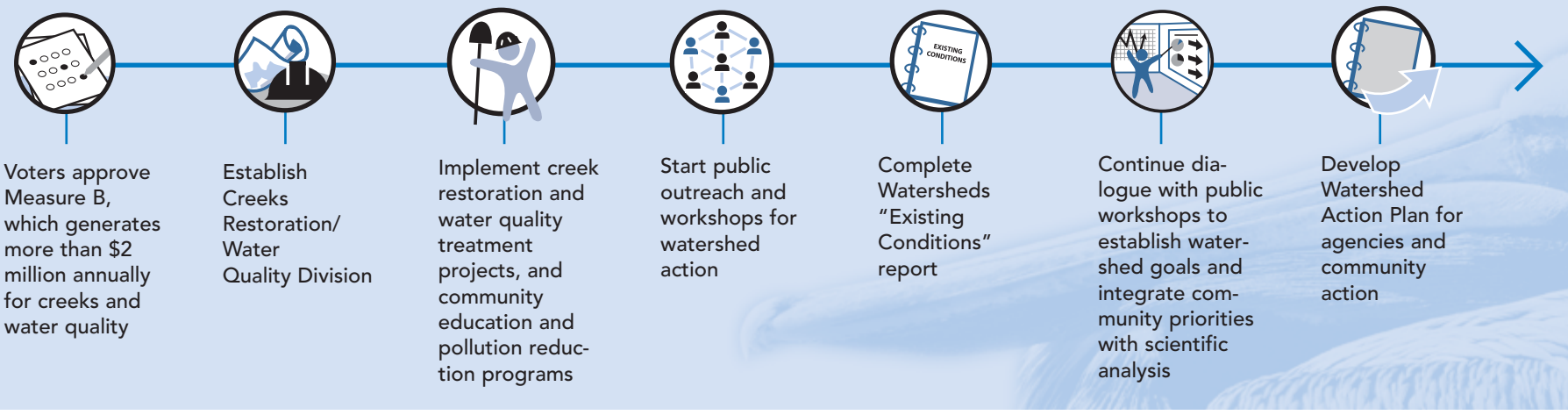
benefits of a healthy watershed

We all live in a watershed—land that is drained by a creek system that flows to the ocean. Sometimes we can see the water flowing through creeks and streams, but other times the water flows underground and in pipes. Healthy watersheds result in healthier environments for humans, plants and animals:

- Improved water quality in creeks and the ocean
- Restored wetlands and riparian habitat
- Reduced impacts from flooding because more water is absorbed into the land
- Groundwater supplies are recharged and available for use
- Reduced creek bank erosion and fewer bank failures
- Reduced invasive plants and more native plants that provide habitat for birds and wildlife
- Fewer manmade barriers and obstructions for fish to reach spawning grounds
- Quicker recovery from fire, landslides and other large disturbances
- Healthy creeks that help filter and remove toxins from water before it reaches the ocean
- Clean beaches for recreation and community access

The City is now developing Watershed Action Plans to guide coordinated improvements of our watersheds. There are lots of ways to get involved, including steps you can take right now to help protect our watersheds and beaches.

santa barbara watersheds action plan development



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