Watershed-friendly Development for Sierra Communities

The fast growing Sierra Nevada is home to 24 watersheds that provide over 65% of the state’s water supply. How and where future growth occurs is essential to the long-term sustainability of the region’s water. This fact sheet provides strategies to align water and land use planning.

**What is a Watershed?** Watersheds are systems that connect land and water. A watershed is the area of land that drains into a river, stream, lake or other water body. All but one of the 24 watersheds in the Sierra Nevada have stretches that are currently impaired under Clean Water Act standards.

**The Water and Growth Dilemma** For Sierra communities it is not a question of "if we grow," but "how." By 2040 the Sierra region will need to accommodate between 850,000 and 1.75 million new residents as the population swells from 650,000 to as many as 2.4 million people.

In recent decades the predominant development patterns in the Sierra have been inefficient - covering valuable land, increasing water pollution, stressing water and wastewater infrastructure and creating higher demands on needed water supplies. Characterized by dispersed, low-density development, this type of growth is untenable for the region's watersheds and the resources they provide.

**The Water Impacts of Development** During development, land is converted from absorbent soils and vegetation to impervious surfaces like roads, buildings, and parking lots that prevent water from infiltrating into soils. This leads to increased runoff and flooding, loss of groundwater recharge, and degraded water quality. Additional development also increases water consumption, and therefore demand – straining the sustainability and reliability of our water supplies.

**Quality Growth – The Importance of Location, Form and Design:** When it comes to water, where and how we grow matters most. The location, form and design of development determine its impact on water resources.

**Location:** Certain parts of our watersheds should be protected - others are better suited for development. Determining where to grow and where not to grow is key.

**Form:** Compact community form is essential to efficient, watershed-friendly development.

**Design:** Our buildings, neighborhoods, and communities can be designed to minimize the impacts of development on water resources.
Where to Grow

Planning with an eye for water requires a community dialogue about where to grow and where to protect. Both sides of this decision are critical. Targeting areas to grow is as important as targeting areas to conserve.

Protect Valuable Natural Areas

Wetlands, meadows, forests, floodplains, streams, riparian zones, and other natural systems play vital roles in capturing, filtering, storing and transporting our water resources. Preserving these vital parts of our watersheds is critical to water quality, reliability, and ecosystem health.

To start:

⇒ Set Goals – Determine what benefits are sought and set goals for meeting them;
⇒ Identify – Determine the location of undeveloped natural resource areas.
⇒ Prioritize – Rank areas according to their natural resource value.
⇒ Protect – Use planning tools, incentive and acquisition programs, and land use regulations to protect valuable areas and direct future growth.

Direct Future Development

Planning for water protection also requires decisions about where we *will* grow. For the sake of water resources, the best locations are those that are already disturbed and served by infrastructure. Local policies should direct growth to strategic locations within and around the community to prevent rural sprawl.

Goals for Conservation

⇒ Preserve large, continuous areas as open space to protect natural infrastructure for infiltration and water recharge.
⇒ Preserve and enhance ecologically valuable areas such as wetlands, floodplains, and riparian corridors.
⇒ Create multi-benefit parks and open space within and around the community to prevent building on sensitive lands.

Watershed Protection Takes Teamwork

Communities need to work collaboratively to protect their common watersheds. The shared benefits include:

⇒ The protection and enhancement of local water quality.
⇒ The maintenance of a region's "natural infrastructure."
⇒ A reduced risk of floods and forest fires.
⇒ The preservation of natural habitats and the recreational resources that residents value.
Development Patterns and Water

Dispersed, low-density development consumes more valuable natural infrastructure in our watersheds including wetlands, flood plains, critical habitat, aquifer recharge areas, stream corridors, and prime soils. These areas are needed to sustain abundant high quality water and functioning watersheds.

The predominant development pattern in the Sierra – characterized by large lots, low density, and dispersed development – creates disproportionately high impacts on water resources when compared to more compact development patterns. Lower density patterns lead to:

→ Greater amounts of stormwater runoff (per capita).
→ Increased infrastructure demands to support the regional economy.
→ Greater water consumption.
→ More consumption of open space.
→ Higher costs for water treatment and delivery.

“Lower-density development always requires more land than higher densities to accommodate the same amount of growth. When more land is disturbed, more of the watershed is damaged.” (EPA, 2002)

Compact Community Form Protects Watersheds

Compact form reduces the “footprint” of development, minimizing impervious cover and reducing growth impacts in the watershed. Compact development relies on mixing uses, directing development to developed areas, using compact building design and ensuring walkability.

Strategy: Encourage Mixed Use Development

Separating land uses, such as housing and commercial areas, drives sprawl, disperses growth, siphons spending from downtowns and creates auto-reliant communities. Mixing uses brings complementary land uses together as they were in historic downtowns. This supports compact form, vibrant and walkable downtowns and a jobs-housing balance. For the watershed it means less impervious coverage, reduced consumption of valuable lands, and more water-efficient development patterns.

Strategy: Use infill and Revitalization

Infill reduces rural sprawl by capturing new growth within existing communities. Infill uses land and infrastructure more efficiently, brings spending into the community and focuses investment on fixing, rather than extending, current infrastructure systems. By concentrating development to areas that are already disturbed, infill and redevelopment prevent impacts to the watershed and the resources they provide.
Arbors Project, Murphys, CA

The Arbors is 1.5-acre mixed-use, infill project built on Main Street in downtown Murphys. The project mixes retail, diverse housing types, tourist accommodations and allows off-street parking – all of which support compact form, relieving development pressure on the watershed. The project has been unexpectedly lucrative, boosting the local rental market. The Arbors’ success is in part due to the open and collaborative public process during the design phases of the project. For more information: Rudy Ortega, Architect, 209-728-2025

Truckee Railyard, Truckee, CA

The Truckee Railyard project is a model for infill and redevelopment. It shrinks the “footprint” of development while integrating “green infrastructure” into the community. The project features a mix of housing, retail and commercial uses with pedestrian, bicycle and vehicle access that will be built on a brownfield site in downtown Truckee. The project also includes on-site drainage features and creek restoration. If approved, it would be built in three phases over 10 years. For more information: Darin Dinsmore, Planning Consultant, 530-277-0196.

Model Policy - City of Sonora’s General Plan Supports Efficient Development

The City of Sonora’s General Plan includes language, such as the policy below, to encourage efficient development, which protects valuable watershed lands, makes use of existing infrastructure, and supports compact community form.

Model Language: Provide a well-organized and orderly development pattern that maintains and enhances the City of Sonora’s social, economic, cultural, environmental, and aesthetic resources while managing growth so that adequate facilities and services can be provided in pace with development.

Village Homes Natural Drainage System

Village Homes, a development built in 1970’s in Davis, CA is a model for incorporating green infrastructure into a site design to manage stormwater runoff. The 240 unit mixed-use residential development does not have a conventional curb and gutter storm sewer system to manage runoff. Instead, a network of vegetated swales wind thorough the community, providing common open space while functioning as a “green” stormwater drainage system that captures runoff from the development. Village Homes also features narrow streets, large areas of common open space, locally appropriate trees and other native vegetation. For more information or a tour, visit www.lgc.org
Mariposa County General Plan Protects Open Space and Agricultural Lands

In 2006, Mariposa County adopted a new general plan that designates 61% of the County (426,000 acres) as agricultural, while just 13% of the County (86,700 acres) is designated for Residential Development. The new plan also contains mandatory groundbreaking policies to ensure that growth happens in and around existing communities. By protecting open space areas and encouraging city-centered growth Mariposa's general plan reduces development on watershed lands protecting water resources.

For a fact sheet:

Placer Legacy’s Provides Natural Infrastructure for Water Protection

The Placer Legacy Open Space and Agricultural Conservation Program is a voluntary, non-regulatory program that allows willing buyers and willing sellers to acquire land for conservation and open space uses. Since its inception, about 5,500 acres of land have been preserved, providing community benefits while protecting watersheds and the water they supply. For more information: Ed Sullivan (530) 745-3030

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Sustainable Site Planning and Design

Minimize disturbance and protect natural assets: Concentrate buildings and infrastructure on a smaller portion of a site and incorporate the site’s natural assets to conserve open space and avoid sensitive areas.

Use Low Impact Development (LID) to manage stormwater runoff: Stormwater runoff results when land is converted to impervious surfaces, like roads and buildings, that prevent the infiltration of rainwater. The increased runoff erodes stream channels, degrades aquatic habitat, and carries pollutants into local water bodies.

Low Impact Development (LID) relies on a suite of site design techniques that infiltrate, filter, store, evaporate, and detain runoff on-site. LID can be integrated into streets, yards, commercial areas, parks, and other areas to minimize the impact of development.

Increase Efficiency & Conservation

Water wise landscaping: Using native and drought tolerant plants, and water efficient planting materials, irrigation technologies and other practices can reduce outdoor water demand by up to 75%, while providing a beautiful landscape.

Install water efficient technology: Cities and counties can work with water agencies to encourage more efficient plumbing in new and existing development. Local governments can require water saving technologies such as low-flow toilets, faucets, and washing machines in new development and/or provide incentives and rebates to promote their installation.

Coordinate Wastewater Management and Land Use Planning

Coordinated wastewater management: Wastewater management decisions affect growth patterns, while growth patterns have pronounced effects on the need for wastewater infrastructure and options for wastewater treatment. Land use and wastewater agencies should coordinate to reduce service demands on wastewater treatment facilities and ensure consistency between land use plans, and the need for wastewater infrastructure. Areas without sewer systems should have set criteria for allowable types of “decentralized” or “on-site” treatment systems that will not have adverse impacts to water quality or result in dispersed, low-density development.

Water Recycling: Water recycling creates a locally reliable, drought-proof source of water by treating and reusing municipal wastewater for various needs such as irrigation, firefighting, and carwashes. Regionalizing wastewater systems can create the “economy of scale” needed to support the development of recycled water. Requiring the use of “purple pipe” (required by state law to distinguish recycled water from fresh water) in all new development ensures that recycling is an option.

Integrate and Coordinate: Protecting water resources through better planning requires coordination between local governments, water agencies, conservation groups, land trusts, public land managers, citizens and others interested in the region’s land and water. Planning in a vacuum, without recognizing connections between various issues, can have disastrous consequences and miss the benefits of an integrated approach. Communities can take advantage of state