



# BAY AREA MONITOR

December 2015/January 2016

Volume 41, Number 3



## The Congestion Conundrum

By Cecily O'Connor

Bay Area traffic is frustrating. It's getting worse. It's counterproductive.

These are impressions transportation officials, advocates, and executives have of traffic in the nine-county region, based on recent interviews. About half of congestion is due to bottlenecks, according to Metropolitan Transportation Commission data. Traffic incidents, work zones, and bad weather account for the remainder.

No matter the cause, commuters are weary because travel times are spreading past traditional peak hours during the work week and weekends.

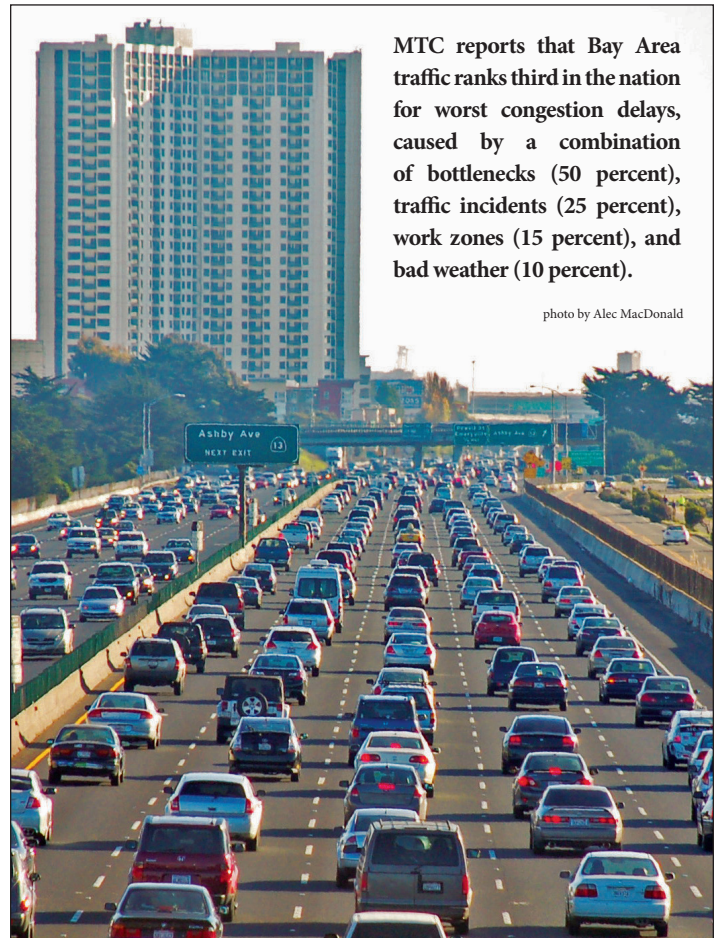
Public transit is equally jammed. Among BART's top 10 ridership days ever, six occurred this year, according to spokesperson Jim Allison. Ridership in September was a whopping 445,103 per weekday. To ease crowding, BART recently tweaked its schedule and added some restored cars back into service. Longer term, the transit operator is planning \$3.8 billion in improvements, including new cars, a control system, and a revamped Hayward maintenance complex.

All the congestion is a domino effect of a healthy economy and population growth, the latter jumping 1.3 percent last year. Data suggests the region could attract another two million residents over the next 25 to 30 years, which means city officials and transit leaders are trying to address traffic within a pile-up of challenges: funding shortfalls, emissions reduction mandates, affordable housing requirements, and demand for multi-modal transportation choices that provide access to amenities and services.

Traffic is "a problem for a lot of people trying to meet their daily needs and a very big challenge for policy makers," said Ratna Amin, transportation policy director at SPUR, a Bay Area nonprofit organization focused on civic planning. "The

MTC reports that Bay Area traffic ranks third in the nation for worst congestion delays, caused by a combination of bottlenecks (50 percent), traffic incidents (25 percent), work zones (15 percent), and bad weather (10 percent).

photo by Alec MacDonald



way people are affected by congestion is uneven throughout the region, depending on how communities have been designed and how far people need to go," she added.

In the near term, officials are turning attention toward express toll lanes and other roadway management strategies

*continued on page 2*

### Bay Area League Day 2016: "Reinventing Bay Area Transportation for the 21st Century"

On Saturday, February 6, the League of Women Voters of the Bay Area will host its annual Bay Area League Day. Focusing on transportation funding, innovation, and policy, the forum will feature a keynote by Jim Beall, chair of the California State Senate's

Committee on Transportation and Housing. Registration begins at 9:00 a.m. with the program to follow from 9:30 a.m. to 2:30 p.m. in Maple Hall Community Center at 13831 San Pablo Avenue in the City of San Pablo. Visit [www.lwvbayarea.org](http://www.lwvbayarea.org) for more information.

## The Congestion Conundrum (from page 1)

to help reduce commuters' travel time. Carpools, employer shuttles, ride-sharing, public transit schedule adjustments, and even cash incentives are also driving those commuters to re-think how and when they get around.

Still, dealing with traffic is not a seamless process, since the labor force often lives and works in different cities and is increasingly priced out of core areas like San Francisco and Silicon Valley.

Statistics highlighted in *A Roadmap for Economic Resilience*, released in early November by the Bay Area Council, signal frustration. According to the report from the business-sponsored advocacy group, more than 20 percent of regional commutes last longer than 45 minutes. Freeway delays due to congestion are up nearly 40 percent from 2010. Seeking cheaper housing, more than 3 percent of the workforce commutes from outside the region.

"The Bay Area consists of 101 cities, but it is one economy with more than 7 million people living, working, and recreating across the region," stated the report, which recommends alignment among the region's 26 transit agencies to support the current economic growth cycle — and prepare for the next.

However, cities are "limited in what they can do because congestion doesn't stay put" within boundaries, said Elizabeth Deakin, UC Berkeley professor emerita of city and regional planning and urban design.

Parking policy, rather, is one area where they have greater control, she added. Pilot parking projects in cities like Berkeley have shown that dynamic pricing on high-demand streets can change driving patterns and encourage use of other transportation modes.

"If all these things can work synergistically we can make progress," SPUR's Amin said. "When you enable people to get

by without a private automobile, then they don't need parking."

While travel without a car isn't always feasible, new options are poised to influence commuters' decisions. MTC has begun to incorporate 550 miles of regional express lanes in major corridors over 25 years as part of Plan Bay Area 2040, the latest iteration of the regional housing and transportation roadmap. Most are being converted from existing carpool lanes.

In the new express lanes, carpools and vanpools travel for free, but solo drivers must pay. Tolls, based on demand, are displayed on overhead signs and collected via FasTrak tags. The resulting revenue goes to operation and maintenance costs.

Two such lanes are already open: southbound I-680 from Pleasanton to Milpitas, and SR-237 between Milpitas and San Jose. Pricing on I-680 over the Sunol Grade ranges from 50 cents around midday to as much as \$7.50 during peak period portions, said Lisa Klein, MTC's express lane program principal. On average, tolls are \$2.30.

"The idea is you want to keep that [express] lane free flowing," Klein said.

An express lane on I-580 between Livermore and Dublin is expected in early 2016, followed by I-680 between Walnut Creek and San Ramon next fall.

In addition, MTC wants to use adaptive ramp metering as part of a coordinated control system to pace traffic and reduce freeway merging conflicts. It's one of seven strategies to maximize roadway efficiency through MTC's proposed \$595 million "Columbus Day Initiative."

"Typically, we see a decline in demand on the system of 3 to 5 percent on Columbus Day [which] yields a 50 percent drop in congestion-related delays," said MTC Public Information Officer John Goodwin.

It's too early to tell the effect of applying "Columbus Day"

### About the Bay Area Monitor

Launched in 1975, the *Bay Area Monitor* is published six times a year by the League of Women Voters of the Bay Area Education Fund, and covers transportation, air quality, water, open space, and land use issues in the nine-county San Francisco Bay Area. The publication is distributed to League members, elected and appointed officials, government employees, libraries, media outlets, nonprofit organizations, business leaders, and engaged residents. Every edition is also posted online at [www.bayareamonitor.org](http://www.bayareamonitor.org).

Subscriptions to the *Monitor* are free, but reader donations are encouraged and help to sustain the publication. Donations are tax-deductible, as the League of Women Voters of the Bay Area Education Fund is a nonprofit 501(c)3 organization.

The *Monitor* is also supported by the Alameda-Contra Costa Transit District, the Bay Area Air Quality Management District, the East Bay Municipal Utility District, the East Bay Regional Park District, the Metropolitan Transportation Commission, the Midpeninsula Regional Open Space District, the Peninsula Corridor Joint Powers Board and the San Mateo County Transit District, the San Francisco Bay Area Rapid Transit District, the San Francisco Bay Area Water Emergency Transportation Authority, the Santa Clara Valley Open Space Authority, the Santa Clara Valley Water District, and the Sonoma County Water Agency. The *Monitor* retains editorial autonomy from its supporters.

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Alec MacDonald, Editor • Linda Craig, LWVBA President

logic year-round, but the notion that technology and other strategies can extract the most out of current transportation systems is one that resonates.

“We’re looking at making the existing systems operate better,” said Bill Whitney, principal project delivery manager for the Transportation Authority of Marin (TAM).

For example, TAM will install and turn on ramp metering lights in 2017 along various northbound Highway 101 spots, including the area near Larkspur’s Sir Francis Drake Boulevard onto the Richmond-San Rafael Bridge. The timing of this move coincides with a project to convert the existing bridge shoulder into a new eastbound car travel lane.

Emphasis on using “what we have” is also reflected by green commuting participation. Carma, which maintains a carpooling network accessible via a smartphone app, has seen usage jump threefold for each of the last two years, said Paul Steinberg, the company’s chief business officer.

Meanwhile, transit programs from big employers like Genentech continue to pick up steam. Alternative transit use at the biotech company — inclusive of employee shuttles, public transit, biking, and vanpooling — has risen to 43 percent, up from 28 percent in 2007.

Beyond these options, behavioral shifts are important. San Mateo County transit officials are encouraging work and school carpools by offering cash incentives to new users, said John Ford, executive director of Commute.org, the county’s transportation demand management agency.

Perhaps even bigger changes are in store for current and future commuters next year.

It’s expected 2016 will usher in ballot measures aimed at bond investments and sales tax hikes to fund transit infrastructure and other improvements. State legislators,


## Nominations Open for Transportation Awards

Every two years, the Metropolitan Transportation Commission solicits nominations for exceptional contributions to Bay Area transportation. The “Excellence in Motion” awards recognize individuals, projects, and organizations that have had a positive impact on mobility in the region. Nominations for the 2016 awards are open to the public from now until March 31. Winners will be selected by a jury representing MTC and the community. Awards will be presented in the fall of 2016.



Nominations can be for an individual, organization, jurisdiction, agency, firm, program, or project. All eligible nominees must have been active or under way during the two-year time frame from April 2014 to March 2016. To learn more about the awards and to submit a nomination, visit [mtc.ca.gov/awards](http://mtc.ca.gov/awards) or contact Terry Lee at [tlee@mtc.ca.gov](mailto:tlee@mtc.ca.gov) or (510) 817-5952.

after several failed attempts, continue to work on a proposal that would create a reliable transportation funding source and address a backlog of repairs commuters see daily.

UC Berkeley’s Deakin pointed out congestion is not necessarily the “worst thing,” especially if it serves as a catalyst to modernize city goals and create a more multi-modal transportation system. Traffic is “an indication an area has some hustle and bustle,” she said. 

*Cecily O’Connor covers transportation for the Monitor.*

## Keeping Microplastic out of the San Francisco Bay

By Robin Meadows

Looking at the San Francisco Bay, you’d never know it’s dotted with tiny pieces of plastic. But new research shows that, like other waters across the United States, the Bay is contaminated with billions of plastic beads, particles, and fibers, all five millimeters or smaller. This microplastic threatens fish and may also threaten people who eat them.

“We can’t recover it once it’s into our watersheds and oceans,” said Stiv Wilson, campaign director at The Story of Stuff, a nonprofit in Berkeley. “People are focused on plastic bags but the small stuff is more dangerous. We need to broaden the dialog.”

Wilson’s recent focus has been microbeads, the teeny abrasive spheres in toothpaste, facial scrubs, and other personal care products. When we rinse our mouths and faces, microbeads go down the drain and into waterways, where fish mistake them for food. “They look like fish eggs, which are a staple of fish,” Wilson said. Microbeads also end up in the plankton that fish and other aquatic animals eat, as well as in corals and shellfish, which filter water for microscopic foods. “It’s like putting uncooked spaghetti down the throats

*continued on page 4*



## Keeping Microplastic out of the San Francisco Bay (from page 3)

of filter feeders,” he said.

Eating seafood stuffed with plastic may also be a health risk to people. Toxicants like flame retardants and PCBs (polychlorinated biphenyls) stick to plastic, and microplastics can concentrate and transport these pollutants. In a 2015 study, researchers at UC Davis and the Bodega Marine Laboratory in Sonoma County found plastic debris and fibers in a quarter of the fish sold for human consumption in Half Moon Bay.

San Francisco Estuary Institute scientist Rebecca Sutton expected to find microplastics in the Bay. But she didn’t expect to find so many. “It caught me by surprise how high they were compared to waters in other large urban areas,” she said. Her research, published in September, showed that the South Bay has one million pieces of microplastic floating on top of each square kilometer — nearly 10 times more than in Lake Erie.

“The Bay can be a trap for pollutants,” she said. “Water sits here due to the geography.” The only way for water to get out is through the Golden Gate, and this strait is so narrow that it limits turnover.

As a first step in keeping microplastic out of our waters, Wilson helped enact a ban — Assembly Bill 888 — on microbeads in California. While we are not the first state to outlaw microbeads in personal care products, our ban goes further than others. “Companies can’t use plastics claimed to be biodegradable,” he said, explaining that such assertions are unproven. “It’s the toughest ban in the nation.” AB 888 went into effect in October and gives manufacturers until 2020 to phase out microbeads. Natural replacements offer a range of abrasiveness and include beeswax, nuts, seeds, shells, and even sand.

Sutton plans to track the impact of the ban by monitoring microbeads in the Bay, which enter via wastewater treatment plants. In a 2015 study, researchers at UC Berkeley and UC Davis estimated that the United States alone dumps 8 trillion microbeads into aquatic habitats every day.

But microbeads are not the worst problem when it comes to microplastics. Much of the microplastic Sutton found in the Bay was irregular particles, which probably come from big pieces of styrofoam and other plastics that break down over time. “They’re fragmented by wear and tear, and


sunlight,” she said. The resulting particles probably enter the Bay in stormwater. So, Sutton plans to monitor creeks and other drainages to the Bay for microplastics, which will help us identify and clean up the sources.

She also found that the Bay is full of little plastic fibers, especially near wastewater treatment plants. The most likely source is our clothes. Fleece is made of polyester, for example, and stretch fabrics get their elasticity from spandex. When we wash a load of clothes that contain synthetic materials, they release microplastic fibers into the water. A single synthetic garment can shed more than 1,900 of these minute fibers, according to a 2011 study led by Mark Browne, an ecologist at UC Santa Barbara.

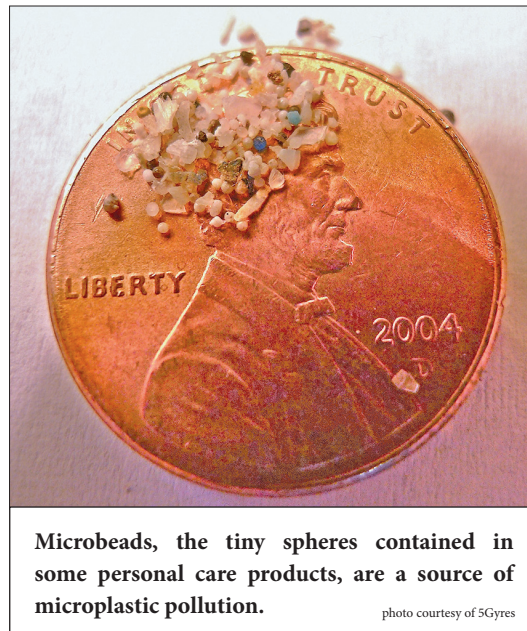
The rinse cycle sends microplastic fibers that detach from our clothes down the drain, and our wastewater treatment systems are not equipped to filter them out. When microplastic fibers get into waterways, they spread widely. Browne found them on beaches all over the world. “It’s a much trickier issue than microbeads,” Sutton said. “We don’t know what would be effective for controlling them.”

Wilson is up for the challenge. “We’re mounting a microplastic fiber campaign in the spring,” he said. Banning synthetic textiles is not the answer, he said, because many are made of recycled plastic and that’s a good thing. And filtering rinse water from washing machines

is tricky because they clog easily, while updating wastewater treatment plants would be “incredibly expensive.” One option is for textile manufacturers to pay into a fund to reduce microplastic fibers. “That would be the most elegant solution,” he said.

While resolving this issue is a long way off, we can start cutting our microplastic fiber footprints right away. You don’t even have to give up fleece. Rather, Wilson recommends wearing natural fiber clothing against your skin and reserving synthetics for outerwear. That way the clothes we wash most often won’t add to the problem. Once microplastics get into our environment, there’s no realistic way to clean them up, so they’ll be there indefinitely. As the saying goes, plastic is forever. 

*Robin Meadows covers water for the Monitor.*



**Microbeads, the tiny spheres contained in some personal care products, are a source of microplastic pollution.**

photo courtesy of 5Gyres

# Refining Refinery Regulations: Air District to Vote on New Rules

By Leslie Stewart

When my husband and I bought our house in Concord 40-plus years ago, we were warned by the previous owners, “Don’t hang clothes out to dry because they’ll smell like gasoline from the refineries.” Refinery emissions, including the noxious odors, are no longer so obvious, but they still contribute to regional air pollution and global climate change.

Refineries process crude oil into gasoline, diesel, and aviation fuel, as well as lubricants and other products used in the petrochemical industry. As they do so, they emit many types of air pollution, including criteria pollutants, toxic air contaminants, and greenhouse gases. Refineries produce approximately 17 percent of the greenhouse gases in the Bay Area. They are the largest individual stationary sources of reactive organic gases, which react with nitrogen oxides to form smog, and they are also the predominant source of sulfur dioxide emissions in the region. Both sulfur dioxide and nitrogen oxides contribute to the formation of fine particulate matter, a significant health hazard.

Most people think of refineries as a collection of process units, pipes, and flares; they also include equipment like boilers, turbines, and heat exchangers. In addition to the air pollution generated by these systems, subsidiary facilities (like sulfuric acid plants) and activities like truck and tanker transport can also produce emissions. All of these sources are currently subject to some level of regulation by the Bay Area Air Quality Management District.

“We’re always looking for ways to reduce emissions from our largest sources of pollutants — checking opportunities by evaluating the cost-effectiveness of a measure,” said the agency’s Rule Development Manager Greg Nudd. The Air District is moving forward on a four-step plan to address refinery pollution: reduce harmful emissions; engage in continuous monitoring; limit pollution and protect health; and ensure refineries use best practices.

Step 1, reducing harmful emissions, is being implemented through the new “Petroleum Refinery Emission Reduction Strategy.” In December 2014, the agency’s board of directors set two targets for the strategy: a 20 percent reduction by 2020 in criteria pollutants and smog precursors, and also a 20 percent reduction in health risks from air toxics. Target pollutants include particulate matter as well as reactive organic gases, nitrogen oxides, sulfur dioxide, and ammonia.



**The Shell refinery in Martinez is one of five regulated by the Air District.**

photo by Alec MacDonald

The strategy has been broken into two parts, based on issues of timing. “Some things could be done quickly to lock in the benefits of emission reductions,” Nudd explained.

The first part of the strategy is a package of four new or amended rules which will be voted on by the Air District board in mid-December. The affected facilities include five refineries — Chevron, Shell, Phillips 66, Tesoro, and Valero — and five related facilities which serve the refineries. Based on emissions inventories from 2013-2014, the proposed package of rules is expected to reduce refinery emissions by 16 percent — 2,596 tons per year — by the target date of 2020.

A second package of rules will be presented in mid-2016 to achieve the rest of the 20 percent target. These rules can’t move as quickly through the process because the Air District staff still needs to gather relevant data. As Nudd put it, “For example, a gas-fired turbine at Valero might be cost-effectively controlled for nitrogen oxides, but what about the others that might come under the rule? They might need expensive environmental reviews or other measures.”

Step 2, continuous monitoring, and Step 3, the commitment to limit pollution and protect health, are being addressed by new draft rules — Rule 12-15 and Rule 12-16 — which will also go before the Air District board for a vote in mid-December. Rule 12-15 would improve the tracking of pollution from refineries, using state of the art methods that allow continuous updating. This would be combined with extensive air monitoring to verify that the reports are accurate and communities are not being subjected to unhealthy levels of pollution. Other reports would be required on facility energy efficiency and the types and characteristics of crude oil being processed. Health risk assessments, updated annually with the new emissions data, would be done on toxic air pollutants from refineries, using

*continued on page 6*

## Refining Refinery Regulations (from page 5)

methods that emphasize protection for neighboring residents.


Rule 12-16 would set lower risk thresholds for refinery toxics, and place limits on certain pollutants to minimize health impacts on surrounding communities. It would also require refinery emission reduction plans, detailing how refineries not meeting the new limits can achieve compliance.

Changes to permitting regulations, to ensure best practices, will be Step 4. Refineries will be required to use the best available control technologies to ensure emissions don't increase when modernizing facilities or changing the types of crude oil they process.

Environmental organizations are both pleased and disappointed by the proposed rules. "We are glad they are promising the frontline communities that have already suffered so much damage from the five refineries that they will reduce various pollutants and cancer risks from them by 20 percent over several years," Jed Holtzman of the global nonprofit group 350.org commented by e-mail about rules 12-15 and 12-16, "but they are leaving greenhouse gases out of the rule." He continued, "Protecting public health and the global climate is in the mission statement of the agency. Reducing [greenhouse gases] from refineries — both for their own sake and as a proxy for egregious co-pollutants impacting fenceline communities — is an extremely effective way to achieve this goal."

Taking a different tack, the Western States Petroleum Association has objected to the rules because they would burden refineries in lieu of addressing larger sources of pollution. As WSPA pointed out in official comments submitted to the Air District this summer, the agency "identified that the most significant toxics impacts are not in the vicinity of the refineries, but are instead in the vicinity of 'the maze' of highways across from the Bay Bridge."

Nudd agreed that refinery emissions are only part of the air pollution picture. "If you look at gasoline and diesel emissions, as well as emissions from refineries, that's over 50 percent of the greenhouse gases in the Bay Area," he said, adding, "Buying less gas is the real key to bringing down pollution."

In any case, Air District data indicate that some critical components of air pollution in the region would be reduced by the proposed measures. The rules which the agency's board will consider in December are the product of a two-year process and already include many changes made in response to industry challenges and pressure from environmental groups. However, they are not yet final. The only certainty is that refinery emissions will continue to be an issue of concern for everyone involved. 

*Leslie Stewart covers air quality and energy for the Monitor.*

## The Working Grass: Four-legged Land Management

By Elizabeth Devitt

In the hills of San Mateo County, a special band of horses became part of a pilot project in grassland management for the Peninsula Open Space Trust. With 20 acres of overgrown property near Pescadero to manage, POST needed the four-legged "experts" to do what they do best: eat like horses.

"These animals eat 18 hours a day," said Sam Harpur, founder of Rediscovering Horses, a nonprofit organization near Santa Cruz that gives unwanted horses another chance. "Instead of using tractors or burns to manage the land, we thought: Why not bring the horses to the land, for the benefit of each?"

The herd was a mixed lot — former racehorses, breeding horses, and show horses — all acquired after each somehow "failed" to serve their previous owner, although Harpur would say it was the other way around. For 12 weeks, the trial partnership with POST gave the animals plenty of room for "forage, friendship, and freedom," three basic needs of healthy horses, according to Harpur. In turn, the happy grazers pared down the plant growth and the threat of wildfire.

"It's been a pretty good relationship," said POST's stewardship assistant, Taylor Jang, of the fledgling partnership. "Historically, horses were kept in Burns Valley, so the project was a nice continuation of that, and we got vegetation management."

With a hospitable Mediterranean climate zone, the San Francisco Bay Area is one of the nation's top hotspots for grassland biodiversity. At the same time, California's native grasslands rank among the most endangered ecosystems in the country. With only about 20 percent of those grasslands on public lands, good stewardship is key to their survival.

Not so long ago, livestock were considered the bane of healthy grasslands — too many mouths might denude the hillsides while too many hooves could trample habitats. But, more recently, there's been a push to reintroduce cattle, horses, sheep, and goats to open spaces, said Jang. Although teaming up with Rediscovering Horses was a new project, POST uses "conservation grazing" on several other properties, including



Driscoll Ranch in La Honda. They aren't the only ones to use grazing as a management tool; among other sites, the Midpeninsula Regional Open Space District recently returned cattle to Mindego Ranch, a 1,000-plus acre property located on the coastal side of Skyline Ridge.

More than half of the 117,000 acres of land owned by the East Bay Regional Park District is managed with grazing animals. An additional 700 acres use goats as part of the district fire department's fuel break program. "We could not manage this large an area of grassland with our existing staff," said Denise Defreese, the wildland vegetation program manager for EBRPD.

Forty herd owners lease EBRPD land for feeding their animals; almost all graze cattle, although two still use sheep and horses. "It's like a prescription," said Defreese. "For each property, you look at what you want to accomplish and then try to determine the best stock to use."

Management goals might include promoting native purple needlegrass or reducing yellow starthistle, an aggressively spreading weed that is toxic to horses, but readily eaten by cows, sheep, and goats.

When land managers choose which animals to use for grazing, they take into account the attributes and preferences of each species. Cows, for instance, only have teeth on their lower jaws so they can't eat the tough woody stuff that serves as fodder for horses and goats. They also prefer to keep their feet on level ground, noted Defreese. Sheep are 'intermediate grazers' that eat grasses and also browse broad-leafed plants such as white clover. Goats, with nimble feet and a full set of teeth, are good on steep terrain and browse a variety of forage. But — myth buster — goats won't eat everything.

"They are much pickier than people expect," said Genevieve Church, the general manager for City Grazing, a San Francisco-based company that rents out goats to control vegetation in areas of two acres or less. Goats turn up their

noses at oleander or boxwood, which are toxic to them, she said. However, the small ruminants have hearty appetites for blackberry brambles, dense "coyote brush," and even poison oak (although only during part of the year); such tastes make the goats suitable for clearing everything from public parks to hidden city yards.

Sometimes, two species work better than one. In Pleasanton Ridge Regional Park, Defreese doubled down on reducing an invasive weed called "medusa head" by letting a herd of sheep eat their fill for nine days, and then putting cattle on the same plot a month later. She has

to wait until spring, when the medusa head comes up again, before she'll know if those efforts paid off. "But that's the cool stuff you can do with livestock," she said. "Otherwise the treatments would be burning, mechanical, or herbicides."

With targeted approaches, grazing not only helps weed out non-native grasses and promotes native plant growth, it can even save habitats for endangered species. In one classic example, cattle on Coyote Ridge, near San Jose, helped rebound the declining Bay checkerspot butterfly population. By grazing down invasive Italian ryegrasses, the cattle made room to grow for a native plant that provides food for the butterfly.

Just keeping grasses short helps maintain habitats for other species. Well-grazed lands tend to have higher populations of ground squirrels, a common critter whose underground complexes may be used by Western burrowing owls, native California tiger salamanders, and other animals. As a side benefit, the man-made "stock ponds" that supply cattle with water also make good breeding spots for the California red-legged frog, which is listed as threatened under the U.S. Endangered Species Act.

"Right after the total conversion of land to some other use, one of the biggest threats to grassland endangered species



A few of Peninsula Open Space Trust's "partners" in grassland management: Rembrandt (Arabian horse, front), Will (Thoroughbred ex-race horse, middle, obscured), and Simba (Westphalian ex-dressage horse, rear).

photo courtesy of Sam Harpur

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## The Working Grass: Four-legged Land Management (from page 7)

isn't grazing — it's the removal of grazing," said Lawrence Ford, a conservation land management consultant and research associate in environmental studies at UC Santa Cruz.

Left alone, native grasses and habitats are lost as the grassland rapidly undergoes succession to shrubland, then woodland. From Ford's perspective, the traditional year-round, extensive grazing practiced by "grandfather and grandmother" was the most effective method of management. "It's what gave us the hotspot of biodiversity that we enjoy today," he said.

But these days, grasslands are managed more intensively to bolster an entire ecosystem, not just livestock production. And grazing isn't a panacea; hoof stock can also gobble up native plants, spread the seeds of invasives, and negatively impact soil erosion and water quality.

"Now we need to take 'grandpa's' grazing strategies and

shave off the rough spots," Ford said. "Let's remove the really egregious practices like damage to riparian areas, damage to water quality, over-concentrated grazing areas that destroy open space aesthetics, and find better ways to deal with conflicts between predators, wildlife, and grazers."

Devising better methods through scientific studies takes time and money — both of which are often in short supply. However, in one new rangeland resilience pilot project, EBRPD is working with the Alameda County Resource Conservation District and the San Francisco Public Utilities Commission to



Goats from City Grazing work to control vegetation across the Bay Area.

photos courtesy of City Grazing

study ways to improve water sources on a cattle grazing site in Sunol. With better distribution of cattle across the landscape, the reduced impact on creeks and riparian areas can improve water quality, according to Defreese.



Elizabeth Devitt covers open space for the Monitor.