Agricultural Land Resources In the San Francisco Foodshed Study Area

Local food depends on local farmland

The concept of a foodshed connects food with its origin; with the land, the resource from which it comes. So, if we want to understand the San Francisco foodshed, it is important to examine the scope and characteristics of the agricultural resource base – shown on the map in the center of this report -- that is the foundation of the great bounty produced by farmers and ranchers in the region. Quite simply, it is local farmland that makes local food possible.

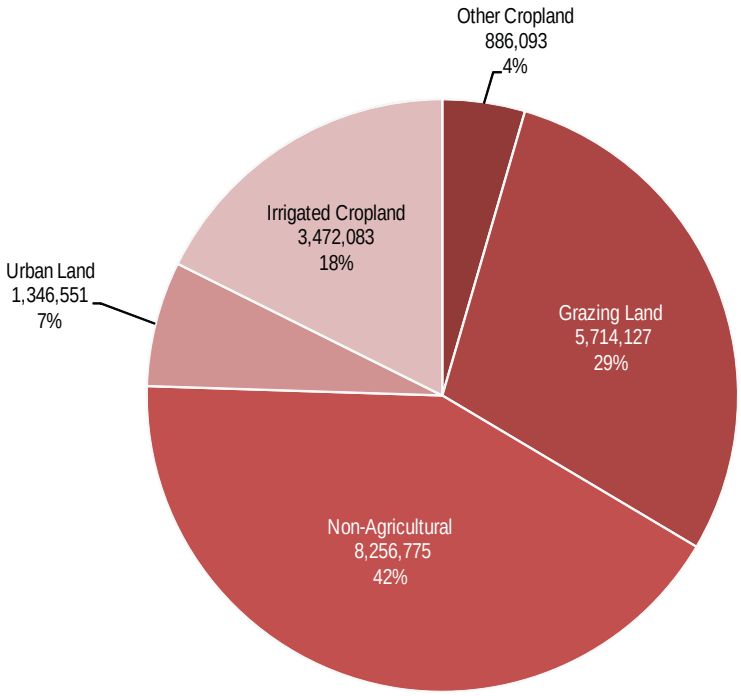
The San Francisco Foodshed is a Diverse Agricultural Resource

Within the San Francisco foodshed study area are a variety of different agricultural sub-regions. By far the most important from the standpoint of total agricultural production is the Central Valley, which American Farmland Trust has ranked as the most productive and most threatened agricultural area in the United States.[1] It is actually composed of two broad river valleys that join at the Sacramento-San Joaquin Delta, from whence the two rivers, the Sacramento from the north, the San Joaquin from the south, flow west into San Francisco Bay. (In this sense, one can think of the Central Valley as the "Golden Gate watershed.") The Sacramento Valley is generally cooler and has a steadier supply of water than the San Joaquin, where agriculture depends almost entirely on irrigation. Together they produce some 300 different crops valued at more than $20 million (though almost half of this comes from Fresno and Tulare Counties, which are not within our study area, even though they do supply food to the City).

East of the Central Valley, the Gold Country is a surprisingly productive agricultural sub-region. There, cattle ranching predominates in the Sierra foothills, but fruit crops like apples have also been traditionally grown in some areas and wine grapes have gained a foothold in more recent years.

On the shore of Monterey Bay south of San Francisco is another incredibly productive, indeed, unique agricultural region, the Salinas Valley – celebrated by Steinbeck in *East of Eden* -- and its smaller cousin the Pajaro Valley.

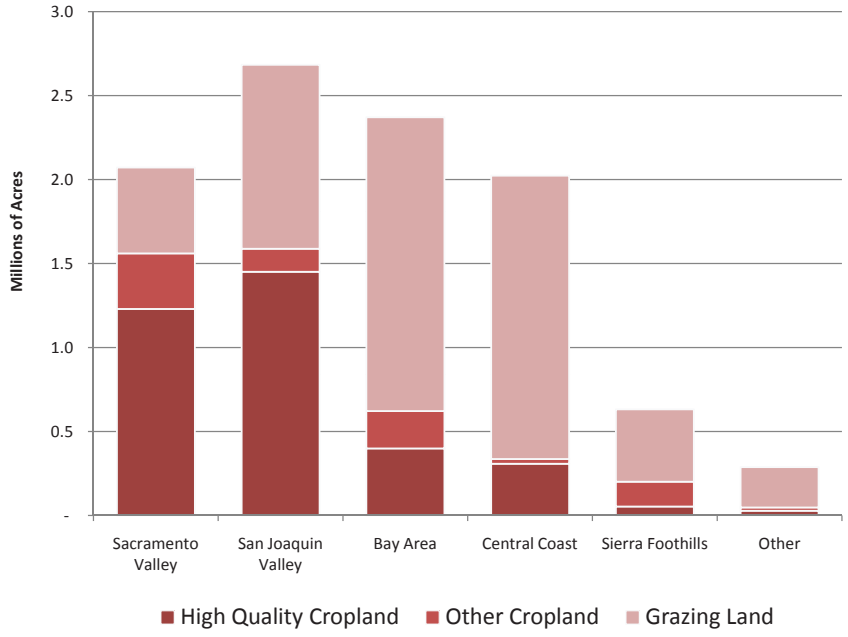
Figure 3.1: Land Within the San Francisco Foodshed Study Area: Type, Acreage, Percentage of Total Area



Source: Farmland Mapping & Monitoring Program, Department of Conservation, California Resources Agency, 2004

1 See, Farming on the Edge, http://www.farmland.org/resources/fote/states/default.asp

Figure 3.2: Distribution of Agricultural Land Within the San Francisco Foodshed Study Area



Source: Farmland Mapping & Monitoring Program, Department of Conservation, California Resources Agency, 2004

Irrigated Cropland Is the Scarcest and Most Valuable Resource

A surprisingly small percentage of the land in the San Francisco foodshed study area is responsible for its agricultural fecundity. Although there are roughly 30,000 square miles (ten million acres) of land within the 25 counties that lie at least partially within 100 miles of the Golden Gate, only half of this land is used for agriculture. The rest is forest, mountains, wetlands or developed for urban uses. (Figure 3.1)

Of all the agricultural land within the study area, only about one-third (3.5 million acres) is high quality, irrigated cropland, located primarily on the floors of the Sacramento, San Joaquin and other smaller valleys. (Figure 3.2) This land typically has fertile soils, abundant water and produces the most valuable and widest variety of crops, including almost all of the fruits and vegetables grown in the region. With its mild Mediterranean climate – California is one of only five places in the world blessed with such a climate[2] – the region's irrigated cropland is considered the most important for agriculture.[3] That is not to say that the other agricultural land within the foodshed is unimportant. Most of it is grazing land that is the source of meat and dairy products. But while these commodities can be produced virtually anywhere, fruits, vegetables, nuts and other specialty crops can be grown only on the region's relatively scarce irrigated cropland.

The climate of both is influenced by the coastal marine layer, resulting in frequent fog and cloud cover.This is ideal for growing lettuces, other leafy greens and tender vegetables, including artichokes. This region is the nation's "salad bowl," producing some of the highest per acre crop returns of any land on earth.

The Bay Area itself once resembled the coastal valleys to the south but, of course, much of what was once unique farmland has been developed. The poster child for what has happened to agriculture in this region is the transformation of what was once known as the "Valley of Heart's Delight," because of its extensive fruit orchards, into Silicon Valley. Yet in the North Bay, abundant specialty crops, notably vinifera grapes, continue to be grown in the Napa, Sonoma and other valleys influenced by the coastal climate. And milk and other dairy products are still produced in the hills of Marin, Sonoma and other Bay Area counties.

2 Others include parts of Chile, Australia, South Africa and the Mediterranean littoral itself.

3 The Farmland Mapping & Monitoring Program of the California Department of Conservation produces "Important Farmland" maps that classify land based on its soils, availability of water and other factors. High quality irrigated farmland falls into three categories: prime, unique (especially suited for fruit production) and farmland of statewide importance. See, http://www.consrv.ca.gov/dlrp/FMMP/Pages/index.aspx

Development is an Increasing Threat to Agriculture in the Foodshed

Though agricultural land in the San Francisco foodshed study area is expansive, it is not unlimited. As in much of California, urban and rural development are steadily encroaching on farmland within the region, shrinking the available resource base, inflating the value of land above what agriculture can afford and creating land use conflicts that increase the costs and risks of farming.[4]

There are various ways to gauge the impact of development, past and future, on farmland and, hence, the agricultural production capacity of a county or region. Among the most telling are the total amount of land developed, the agricultural importance or quality of the land developed, and the efficiency with which it is developed (measured by the number of people accommodated for each acre converted from agricultural to urban use). Within the San Francisco foodshed study area, 1.35 million acres (2,100 square miles) of land have been developed,[5] about 12 percent of the land that was or could be farmed. (Table 3.1) That's a significant amount but, by itself, this loss is probably not enough to be cause for concern. However, one out of seven acres of the urban land in the foodshed study area has been developed just since 1990. That's six times the area of the City of San Francisco and represents a 60 percent increase in the annual rate of land conversion over the historical average. Thus, farmland conversion is accelerating, particularly in the agricultural heartland of the San Joaquin Valley, where, for every four acres developed prior to 1990, another has been developed since then – a very dramatic increase that seems to correspond with a spillover of population from the Bay Area due to its soaring housing prices.

Table 3.1: Amount of Land Urbanized in the San Francisco Foodshed Study Area

Sub-Region	Acres of Urbanized Land in 2004	Percentage of Total Land Area Urbanized by 2004	Percentage of All Urban Land Developed Since 1990
Sacramento Valley	223,426	8.0%	11%
San Joaquin Valley	179,523	5.8%	22%
Bay Area	745,025	16.9%	10%
Central Coast	93,358	2.8%	17%
Sierra Foothills	90,777	3.0%	36%
Other **	14,442	0.5%	12%
Total	1,346,551	6.8%	14%

** Includes only Lake County. No data for Mendocino.

Source: California Department of Conservation, Farmland Mapping & Monitoring Program, as interpreted in *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007)

Table 3.2: Quality of Land Urbanized in the San Francisco Foodshed Study Area

Sub-Region	High Quality Cropland As Percentage of All Land Developed 1990-2004	Acres of High Quality Cropland Remaining Per Acre of Urban Land
Sacramento Valley	37%	5.5
San Joaquin Valley	76%	8.1
Bay Area	22%	0.5
Central Coast	36%	3.3
Sierra Foothills	3%	0.6
Other **	4%	2.0
Total	33%	2.6

** Includes only Lake County. No data for Mendocino.

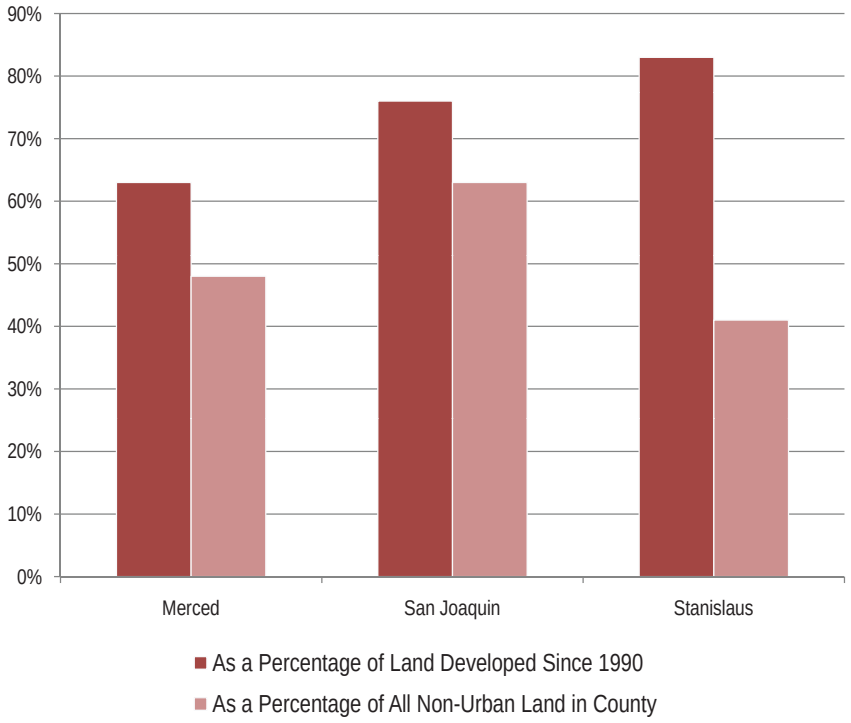
Source: California Department of Conservation, Farmland Mapping & Monitoring Program, as interpreted in *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007)

If we look at the agricultural importance of the land being developed in the region, the picture becomes more troubling. (Table 3.2) One third of all the land developed since 1990 was high quality irrigated cropland – the best in the state, if not the world – so that, today, only 2.6 acres of this land remain for every acre that has been paved over. In the San Joaquin Valley, which produces more than 40 percent of the agricultural output of the study area, high quality cropland comprised 76 percent of all land developed. One explanation for this astonishing figure is that a high percentage of all the land in this sub-region is high quality cropland. But, even so, development is being

4 For a comprehensive picture of what is happening to farmland and why in the Central Valley, see *The Future Is Now: Central Valley Farmland at The Tipping Point* (American Farmland Trust, 2006), http://www.farmland.org/programs/states/futureisnow/default.asp For an even more up to date picture of farmland trends statewide, see *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007), http://www.farmland.org/programs/states/ca/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf

5 The latest comprehensive statewide data available on farmland development is from 2004, which is used for all calculations of development to date.

Figure 3.3: High Quality Farmland in the San Joaquin Valley Within the San Francisco Foodshed Study Area



Source: Farmland Mapping & Monitoring Program, Department of Conservation, California Resources Agency, 2004

disproportionately sited on the best land. (Figure 3.3), mainly because the cities in this region, as they are in much of California, are surrounded by it.

The coincidence of development pressure and high quality farmland places a premium on how much land is being urbanized *per capita*, making this perhaps the most critical measurement of the impact of development on farmland. While population is practically impossible to control, and the proximity of high quality farmland to cities gives cities few options for avoiding its conversion, the way the land is developed is completely within our control – or, at least, the control of local elected officials. It is, therefore, disheartening that the land within the San Francisco foodshed study area is being developed very inefficiently, consuming far more land per person than is necessary to maintain economic growth or the quality of life Californians expect. (Table 3.3)

Throughout the foodshed study area, an acre of land is being developed for every 9.7 new residents.[6] (To get an idea of how spread-out that is, imagine a couple five-person touch football teams playing on the gridiron at Candlestick.) The Bay Area is doing somewhat better, mainly because the compact development in its big cities offsets the very low efficiency of development on its outskirts. Contra Costa, Marin and Sonoma, for example, all fall within the range of five to seven people per acre developed, as does the development on the Central Coast, in the Sierra foothills and in the Sacramento Valley outside Sacramento County itself.[7]

Sacramento County stands out because its recent development efficiency (20.6 people per acre) is more than twice the average for the foodshed study area, illustrating the possibilities of saving farmland while still accommodating significant growth in an attractive, livable manner.[8] Meanwhile, the San Joaquin Valley appears to be developing land a bit more efficiently than average primarily because cities in Stanislaus County are developing only four acres for every five developed in San Joaquin County, and three for every four developed in Merced. That may not sound like much of a difference, but it has saved 32,000 acres (50 square miles) of Stanislaus farmland since 1990.

If the current development trend continues, the San Francisco foodshed study area will lose an additional 800,000 acres of farmland by 2050, expanding the existing urban "footprint" by another 60 percent. At least one-third of this is likely to be the kind of high quality

6 This calculation divides the increase in population 1990-2004 by the number of acres of land developed during the same period. The land developed includes, not just homes, but all commercial and government buildings, and all urban infrastructure such as roads, canals, parks and public utilities – because they all convert farmland.

7 See, American Farmland Trust, *Paving Paradise: A New Perspective on California Farmland Conversion*, 2007, http://www.farmland.org/programs/states/ca/documents/PavingParadise_AmericanFarmlandTrust_Nov07

8 The approximate density of the City of San Francisco itself is about 26 people per acre.

irrigated cropland that now produces the widest variety of fresh fruits, vegetables and other locally-grown foods. If, on the other hand, more local communities were to emulate growth patterns in Sacramento County – where a regional "blueprint" planning process promises to increase development efficiency even farther[9] -- almost a half million acres could be saved within the next generation.

Agriculture in the San Francisco Foodshed Study Area Faces Other Resource Challenges

Land is fundamental to food. But other factors have a powerful influence on both the physical capacity to grow it and the economic viability of agricultural production, whether for local or global markets. We cannot elaborate on all of them here, but will highlight the most significant ones.

Water is critical to agriculture in the semi-arid climate that predominates throughout the San Francisco foodshed and most of California. Our state has been called a "vast plumbing system" because so much of the water used by agriculture, industry and residents comes from impoundments, canals and other conveyances that move huge volumes of it great distances. Since the days when this system was first being developed, there has been competition between agricultural, urban and environmental water users. John Muir saved Yosemite, but regretted the loss of nearby Hetch Hetchy Valley to a reservoir that still serves the City of San Francisco. Today, the controversy continues over whether new dams or conservation – including the possible withdrawal of water from agriculture – is the solution to the state's growing water needs. The prospect of climate change makes the debate even more important. Global warming could not only cause a rising Pacific to submerge the Sacramento-San Joaquin Delta, through which a great deal of the state's fresh water is pumped, it could also shrink the state's biggest reservoir – the winter snowpack in the Sierra.[10]

Table 3.3: Development Efficiency and Future Development in the San Francisco Foodshed Study Area

Sub-Region	Efficiency of Urban Development (People Per Acre Developed 1990-2004)	Projected New Development by 2050 (Acres)	Percentage Increase in Urban Land by 2050
Sacramento Valley	15.0*	138,458	62%
San Joaquin Valley	9.2	217,755	121%
Bay Area	10.7	302,664	41%
Central Coast	6.2	56,031	60%
Sierra Foothills	5.4	85,132	94%
Other **	4.8	4,804	33%
Total	9.7	804,844	60%

** Includes only Lake County. No data for Mendocino.
* Without Sacramento County, efficiency of development in the Sacramento sub-region is 6.9 people per acre.

Source: California Department of Conservation, Farmland Mapping & Monitoring Program, as interpreted in *Paving Paradise: A New Perspective on California Farmland Conversion* (American Farmland Trust, 2007)

Two other pressures on agriculture in the San Francisco foodshed deserve special mention. First, invasive species like the Mediterranean fruit fly and little brown apple moth, which attack food crops, appear to be getting more prevalent as global trade expands. Their control has caused controversy – even though it now emphasizes biological agents rather than pesticides -- because to be effective the sprays must include fruit trees in urban backyards as well as in agricultural areas.

The second issue is competition between agriculture and wildlife habitat. This controversy affects cropland more than grazing land. For example, some tree and vine crops have been excluded from agricultural lands in the Sacramento area because they interfere with the ability of the threatened Swainson's hawk to hunt prey. And orchards have been removed from some lands in the Delta in favor of grain crops that are less valuable to growers, but more valuable to migratory waterfowl.

Complicating the cropland-habitat issue further is the recent concern over the safety of spinach and similar crops due to *e. coli* contamination found on a farm in San Benito County. The so-called "leafy greens" intitiative, calling for the removal of vegetation around fields where these crops are grown, could eliminate both wildlife habitat

9 Sacramento Area Council of Governments, Sacramento Region Blueprint Transportation and Land Use Study, http://www.sacregionblueprint.org/sacregionblueprint/home.cfm

10 See, e.g., U.C. Davis Climate Change Center, http://climatechange.ucdavis.edu/agriculture.html

and a source of beneficial insects vital to integrated pest management (IPM) systems that are the hallmark of organic and “sustainable” agriculture.

To be sure, most of these issues arise from the demands of the highly industrialized agricultural system that has emerged since World War II in California and much of the rest of the nation. People are questioning whether this system is both desirable and sustainable over the long run. Modern agriculture has basically substituted fossil fuel-based technology for human labor and land. How much longer this can continue is anybody’s guess. No less a technocrat than Henry Ford warned, “The farther we get from the land, the greater our insecurity.”