
DRAFT STAFF REPORT

**AGRICULTURE
IN THE
NORTH BAY
PLANNING AREA**

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Prepared for:
The North Bay Wetlands and Agriculture Protection Plan

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FOREWORD

The North Bay Wetlands and Agriculture Protection Program is a voluntary partnership between the San Francisco Bay Conservation and Development Commission (BCDC) and the eight local governments in the San Pablo Bay subregion of the San Francisco Bay area—Napa, Marin, Solano, and Sonoma Counties, and the Cities of American Canyon, Novato, San Rafael, and Vallejo. The approximately 110,000-acre North Bay planning area includes portions of those four cities as well as portions of northern Marin County, southern Sonoma County, southern Napa County, and eastern Solano County. Beginning in Marin County, the planning area is bounded generally by the north bank of Gallinas Creek and the San Pablo Bay shoreline to the south, Highway 101 to the west, Highways 116, 121 and 12 to the north, and Highway 29 to the east, terminating at the Carquinez Strait (see Figure 1).

The purpose of the North Bay Wetlands and Agriculture Protection Program is to: (1) provide local governments with the tools and information needed to ensure the protection, enhancement and restoration of the North Bay wetlands; (2) protect agriculture; (3) allow compatible uses to continue, such as recreation and public education, that are consistent with wetlands and agricultural values and functions; and (4) guide incompatible uses to other appropriate locations. Thus, the program will help local governments protect their wetlands and agricultural lands, increase opportunities for wetlands enhancement and restoration, and identify uses that are consistent with wetland ecological values.

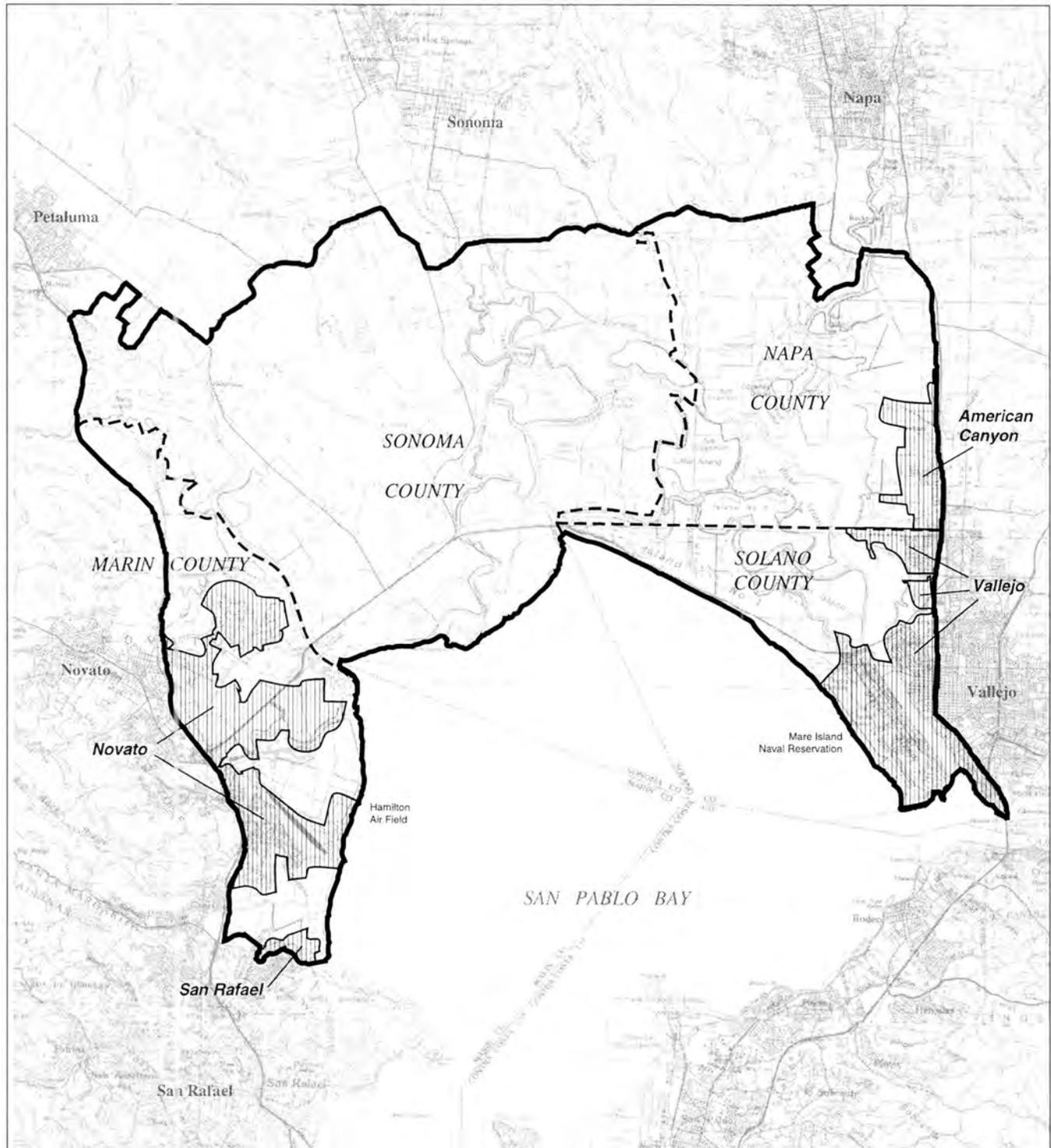
To achieve this purpose, the Steering Committee will develop a North Bay Wetlands and Agriculture Protection Plan. The Plan will recommend a range of policy options that each city and county can use to protect its wetlands. Each city and county can use these options as it sees fit.

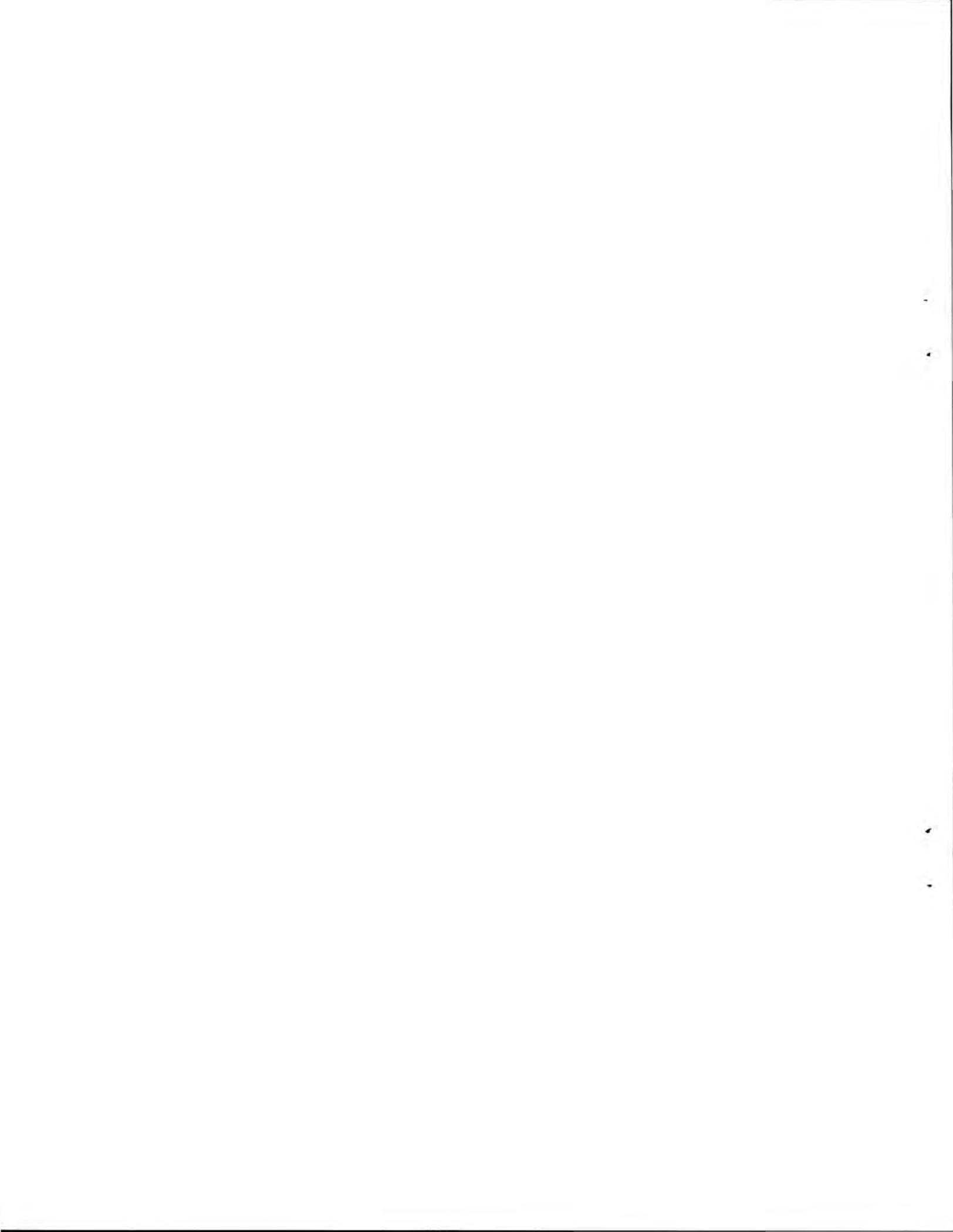
This report on agriculture in the North Bay planning area was prepared by the BCDC staff with help from North Bay farmers. It is a part of a series of planning background reports prepared for the North Bay Wetlands and Agriculture Protection Plan Steering Committee, composed of representatives of each of the local governments in the San Pablo Bay subregion and BCDC. A report on North Bay Land Use and Public Ownership was completed in August. A second report on Wetlands in the North Bay Planning Area was completed in February, 1997. The reports will provide information for the Steering Committee to help it prepare the North Bay Wetlands and Agriculture Protection Plan. Other planning background reports in the series will include reports on polluted runoff and on riparian corridors in the North Bay planning area.

SOURCE: U.S.G.S., 1980; BCDC

North Bay Wetlands and Agriculture Protection Plan Study Area

- Study Area Boundary
- - - County Boundary
- ▨ Portion of City within Study Area





After completing its work, the Steering Committee will submit the North Bay Wetlands and Agriculture Protection Plan to the participating local governments for consideration and adoption of the applicable elements of the plan.

Acknowledgments

Staff is indebted to North Bay area farmers for their insights and contributions to this report.

CHAPTER 1

INTRODUCTION

The original title of the North Bay Wetlands and Agriculture Protection Program was the "North Bay Wetlands Protection Program," and its mission statement was to: "(1) provide local governments with the tools and information needed to ensure the protection, enhancement and restoration of the North Bay wetlands while allowing compatible uses to continue, such as agriculture, recreation and public education, which are consistent with wetland values and functions; and (2) guide incompatible uses to other appropriate locations."

During the course of the program, however, it became increasingly clear that agriculture is not only a "compatible use," but plays an important role in protecting and providing wetlands and wildlife values in the North Bay. The Steering Committee agreed that the protection of wetlands is best served by protecting agriculture as well. The program title was therefore changed to reflect the importance of maintaining agriculture in the North Bay, and the goal to "protect agriculture" was added to the mission statement (see the Foreword).

The purpose of this staff report is to discuss the value of agriculture in the North Bay, the compatibility of agriculture and wetland values and functions, and to recommend actions that can be taken in the North Bay to better protect agriculture. Because wetland values and functions ultimately benefit by maintaining lands in agriculture use rather than developing them for more intensive uses, the report examines some of the problems facing the agricultural industry and individual farmers in the North Bay. While recognizing that many of those problems are national in scope or otherwise beyond the reach of this program, some possible solutions which might be applied on the local level are recommended.

Report Structure

Chapter 2 describes the kinds of agriculture in the North Bay and the importance of this industry for the regional economy and the social and wildlife habitat values of farming. Chapter 3 discusses the interrelationship between agricultural use and wetland values and functions. Chapter 4 examines some of the resource-oriented limitations to farming in the diked baylands and the regulatory, economic, and tax-related issues and obstacles faced by agriculturists trying to farm their land. Chapter 5 examines how local government can protect agriculture, including general plan policies, zoning, and various agricultural support programs, and what local government is currently doing to protect agriculture in the North Bay. Further, the chapter looks at what state and federal agencies and nonprofit organizations can contribute to the protection agriculture in the North Bay. Finally, Chapter 6 presents the conclusions of the report and recommended actions.

CHAPTER 2

AGRICULTURE IN THE NORTH BAY: PRACTICES AND VALUES

As population increases and telecommunication technology permits growth to expand into places it never has before, competition for conversion of agricultural land to other, mostly urban, uses is occurring nationally and in the Bay Area. "Society is the loser when farms disappear" according to Richard Rominger, Under Secretary for Agriculture, in terms of water quality, air quality, wildlife habitat, rural character of the landscape, and sense of place¹.

This chapter briefly describes the kinds of agriculture and agricultural practices in the North Bay in order to provide background and context for readers unfamiliar with farming activities in this part of the Bay Area. This chapter also discusses the values of the agricultural business and lifestyle. Agriculture in the North Bay can be valued in terms of its economic productivity, production of food and fiber, wildlife habitat, regional open space relief in an urbanized region, and retention of a disappearing regional lifestyle.

Agricultural Setting

In the four North Bay counties of Marin, Sonoma, Napa, and Solano combined, there are approximately 1.2 million acres of agricultural land, comprising over 5,000 farms. About half of the land area in each of these counties is in agricultural use (except for Solano where farmland comprises 64 percent of the land area). This information is shown in the table below.

Table 1
Farms and Farmland in the North Bay Counties²

	Marin	Sonoma	Napa	Solano
Number of farms	260	2,737	1,227	850
Land in farms	168,879 acres	517,114 acres	235,290 acres	340,328 acres
% county land area in farms	51%	51%	49%	64%

Agriculture is the major land use in the North Bay planning area, comprising about 54 percent of the planning area's 174 square miles³. Of the nearly 60,000 acres of agricultural land within the planning area, just over 27,000 acres are in diked baylands, and approximately 33,000 acres are

¹ Richard Rominger, CALAFCO Conference, Squaw Valley, California, November 6, 1997.

² The above statistics were taken from the 1992 Census of Agriculture, U.S. Department of Commerce, Bureau of the Census, Washington, D.C.

³ For a more complete description of land uses in the North Bay, please refer to "North Bay Land Use and Public Ownership," the first in this series of background reports prepared by BCDC staff for the North Bay Wetlands and Agriculture Protection Plan Steering Committee

uplands. The agricultural use of the land can be classified as either extensive or intensive agriculture, and is mapped in Figure 2.

Extensive agriculture consists of non-cultivated grazed range and pasture lands and cultivated lands used to grow forage crops, and is the predominant agricultural activity in the North Bay, comprising 84 percent of all agricultural lands in the planning area (about 50,400 acres). On diked baylands, practically all agricultural activity is extensive (about 26,800 acres). The extensive agricultural areas are mostly under dry-land production, receiving no water other than rainfall. These areas are located primarily in the Sonoma Creek and Petaluma River watersheds. However, some grazing lands in Marin and Sonoma Counties are irrigated with reclaimed wastewater.

Intensive agriculture, which includes primarily vineyards but also scattered farmsteads, dairies, and horse stables, comprises nine percent (or 9,580 acres) of the North Bay planning area. As noted above, very little intensive agricultural activity takes place on diked baylands. Intensive agriculture occurs mostly in the Carneros region between the Sonoma and Napa Valleys. Other intensive farming areas include the southern Sonoma Valley, west of Schellville, the Petaluma River area along the Lakeville Highway, and the Sears Point area just south of Highway 37 (see Figure 2)⁴.

The following table shows acreage in each of the counties and cities for agricultural lands which lie within the planning area.

Table 2⁵

Agricultural Lands within the North Bay Planning Area

	Agricultural diked baylands in planning area, acres (% total ag baylands)	Agricultural uplands in planning area, acres (% total ag uplands)	Total agricultural land in planning area, acres (% total)
Marin County ⁶	3,670 (14%)	1,640 (5%)	5,310 (9%)
Sonoma County ⁶	20,400 (75%)	23,330 (71%)	43,730 (73%)
Napa County ⁶	1,030 (4%)	7,310 (22%)	8,340 (14%)
City of Novato	1,830 (7%)	140 (0%)	1,970 (3%)
Other North Bay Cities & Counties Combined	40 (0%)	510 (2%)	560 (1%)
TOTAL	26,970	32,930	59,910

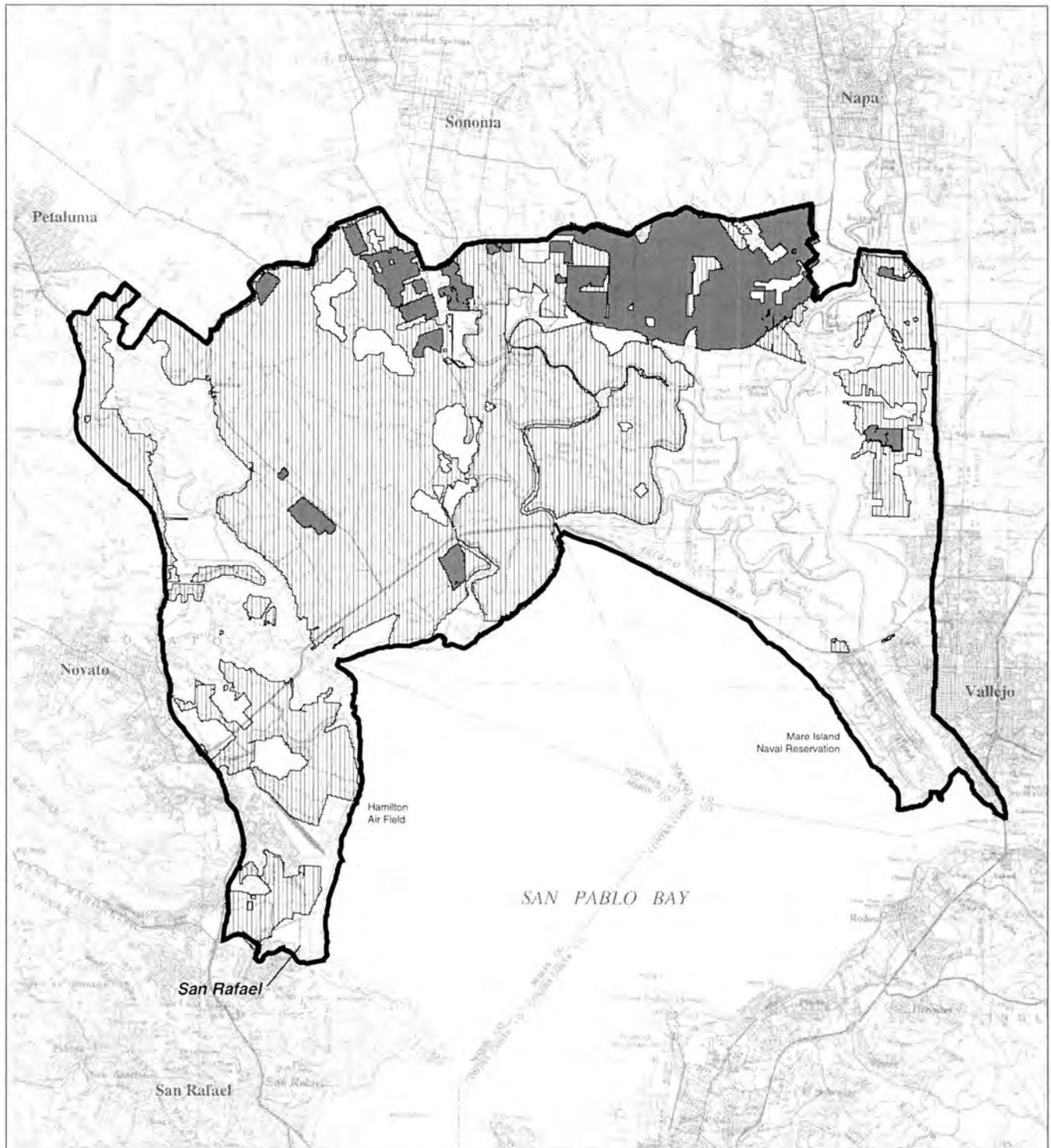
⁴ Partnership for San Pablo Baylands, 1996b.

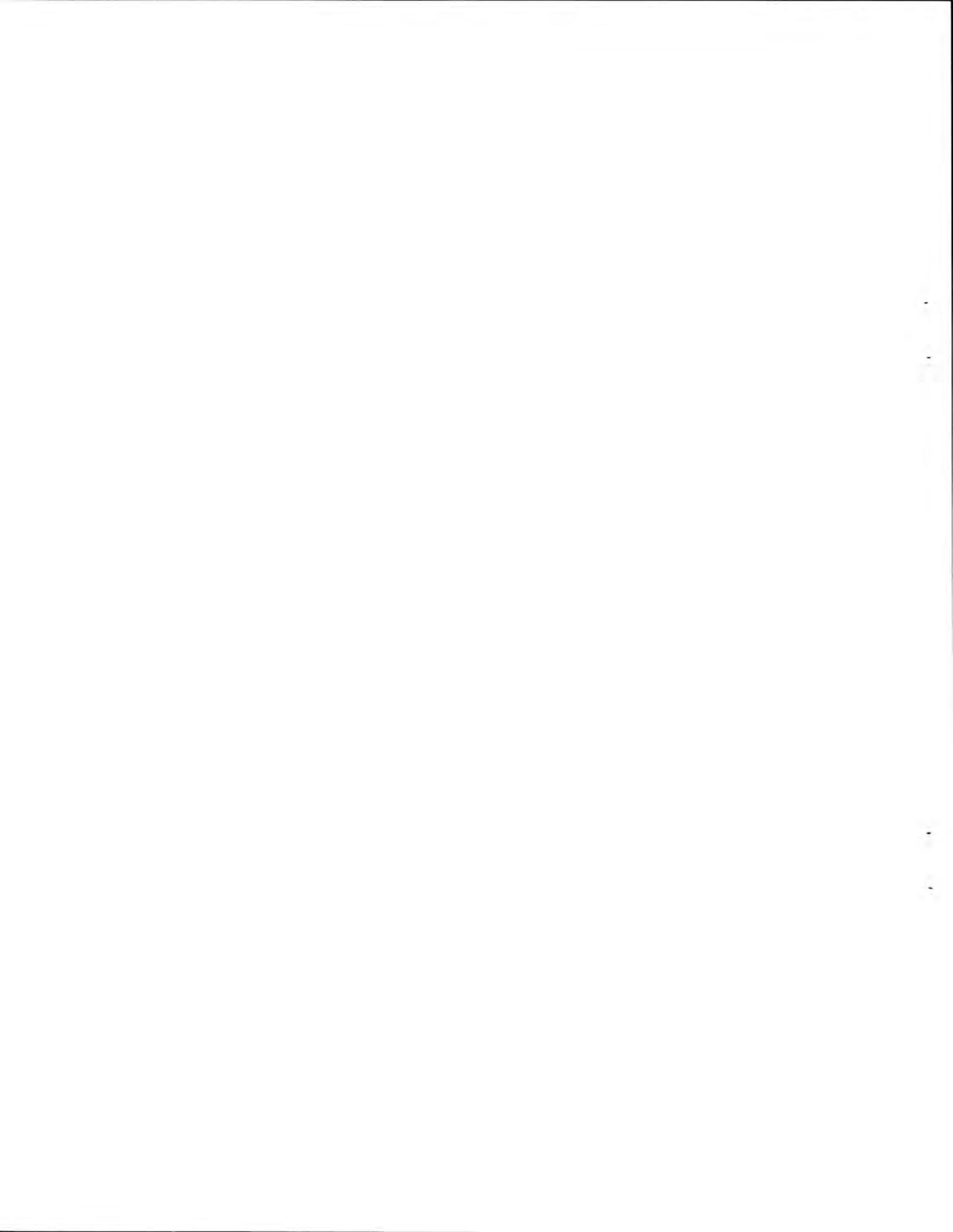
⁵ Figures derived from Grasslinks. See methodology section for more details.

⁶ Unincorporated portions of each of these counties, within the North Bay planning area.

Intensive and Extensive Agriculture in the North Bay

-  Study Area Boundary
-  Extensive Agriculture
-  Intensive Agriculture





Agricultural Practices: Oat Hay and Wheat⁷

Soil conditions, water, climate and topography are the most important factors determining what types of crops can be grown in the North Bay. As discussed above, about 27,000 acres of the agricultural lands in the North Bay planning area are diked baylands. Soils in the low-lying diked baylands are poorly drained, have high salt content, and consist of silty clays with acidic subsoils a few inches below the surface. The water table is usually near the surface. Because of poor drainage, the low-lying baylands are subject to flooding during the winter rainy season⁸.

The combination of highly acidic, highly saline, and low permeable soils, with flooding during the winter months and very low precipitation the rest of the year, severely limits the types of crops which can be grown in the low-lying baylands. One crop which grows relatively well under these conditions is oat hay, and most of the agricultural baylands in the planning area are used for oat hay production. Some wheat is also grown, both for the grain and for hay, and some farmers grow beans along with the oat hay.

Other crops have been grown in the past, such as oat seed, barley, and peas, but have not proven profitable given high production costs and changing market conditions. Irrigation would allow higher value crops to be grown in the baylands, and would increase production of oat hay.

As mentioned earlier, however, aquifers beneath the diked baylands have limited supply and are often too brackish for agricultural use. Reclaimed wastewater holds potential, and several municipal agencies are currently selling recycled wastewater for irrigation purposes⁹. However, the cost of bringing the water to fields which are not near the treatment plants makes this an expensive option, cost-effective perhaps for grape growers and golf course owners, but not for hay farmers whose profit margins are very narrow. Nonetheless, some farmers in the diked baylands continue to experiment with growing higher value crops, including tomatoes and grapes, on baylands soils.

The typical growing season for oat hay and wheat in the North Bay is as follows. The soil is plowed or disced¹⁰ before the rains, and seeded in September or October, or alternatively, plowed or disced after the first rains in order to clear away the sprouting weeds, then planted in December

⁷ This section was written with considerable input from Bill Wright, landowner and former oat hay farmer in Marin County, and Norm Yenni, landowner and oat hay and wheat farmer in Sonoma County.

⁸ San Francisco Bay Conservation and Development Commission, 1983a.

⁹ Several municipal agencies that operate wastewater treatment disposal facilities in the North Bay are currently providing reclaimed wastewater for irrigation. They are: the Napa Sanitation District (which provides reclaimed water mostly to the City of Napa for irrigating pasture lands owned by the City); the Sonoma Valley wastewater treatment plant; the City of Petaluma (for irrigating pasture along Lakeville Highway); the Novato Sanitary District (which irrigates pasture in the Black Point area); and the Las Gallinas Valley Sanitation District (for irrigating pasture lands) (San Francisco Bay Conservation and Development Commission, 1997; and Partnership for the San Pablo Baylands, 1996b).

¹⁰ Soils are plowed or disced on alternate years, with plowing taking place generally once every three or four years. The soil is typically ripped (down to about 30") every five or six years, when the ground is dry (i.e., July or August); in dry years, this allows the soil to store more water, and in wet years, allows water to travel laterally through the soils.

or January¹¹. The fields are sprayed with herbicide two to three weeks after the new plants have emerged from the ground, and harvest takes place typically the end of April through late May, whether or not the fields were planted before or after the first rains. The hay is cut and left to dry in the fields for two or sometimes three weeks before being baled¹². The remaining straw from a grain crop may be cut and sold¹³, which does not draw much income but does reduce the amount of stubble which is then burned. Cattle may also be brought in to pasture on the remaining stubble. The soils may be tilled once the crop is off the fields, to "put the soil to rest" before the next growing season (and then tilled again shortly before planting).

This pattern can vary, of course. Three farmers are currently receiving sludge from various Flood Control Districts, for instance, which increases the soil's productivity¹⁴ and allows the farmers a longer window of time in which to both plant and harvest. The sludge is currently being used by all three farmers to grow wheat, a higher value crop, in addition to oat hay¹⁵. Growing both oat hay and wheat for hay and grain, the season might progress as follows: wheat for grain is planted early, mid-October through November; hay will be planted in the untreated soils December through mid-January, then planted in the sludge-treated soils until the beginning of March (and sometimes as late as mid-April). Harvest will start generally in May (or sometimes late April), beginning with the earlier-planted hay. The later-planted hay will be ready for harvest around June, and grain will be harvested by about mid-July. The grain eventually goes to local feed mills for cattle and poultry.

As mentioned previously, the low-lying diked baylands are susceptible to flooding during the winter. It is important that ditches are well-maintained and remain clear to allow the pumps to effectively remove collected. Fields may also be leveled once every 10 or 15 years to reduce ponding.

Though some freshwater flooding is not problematic for the hay crops, salt water flooding would be disastrous. Levee maintenance is absolutely critical to prevent breaches and overtopping, and is an on-going operation. One farmer who manages some 10 miles of levees, for instance, says he typically caps off one-half to one mile every year.

¹¹ Plowing or discing and then planting after the first rains will result in less tonnage, but in higher quality hay. The demand for higher quality hay has increased notably during the past 30 years, with an increased percentage of hay being sold for horses rather than cattle (Norm Yenni, personal communication).

¹² Hay cut before May stands a greater chance of getting rained on, and thus developing mold. In the words of one farmer, the tiniest bit of mold in the hay could ruin a farmer's reputation.

¹³ There is a growing market for straw for use in soil erosion control. Mushroom growers also use large quantities of straw.

¹⁴ While bayland soils might typically produce 2-2.5 tons/acre of hay, bayland soils treated with sludge might produce 3-3.5 tons/acre of hay.

¹⁵ Although sludge increases, there are some potential drawbacks. For example, treating soils with sludge may preclude the possibility of growing crops for direct human consumption, such as tomatoes, due to potential contaminants or heavy metals in the sludge.

Agricultural Practices: Dairies¹⁶

Dairies in the North Bay are located in the Schellville area, and north and south of Hamilton Air Force Base. North Bay dairies provide about half the milk and milk products consumed in the Bay Area¹⁷.

The largest dairy in the North Bay region has about 1,500 head of cattle, about 1,000 of which are milked twice daily (some dairies milk three times per day). Most dairies in the area are one-half to one-third that size, however.

Bringing that many cattle out to feed in pastures is usually more trouble than bringing the "pasture" to the cattle¹⁸. Many dairy operators, therefore, grow their own hay, cut it while it is still green and make ensilage, a fermented, more easily digestible feed which can be mechanically fed to the cows. The ensilage is supplemented with oat hay, wheat, rye, or alfalfa, generally purchased from outside suppliers. Oat hay is the least expensive supplement and provides an important source of calcium and fiber. Calcium is particularly important for cows before they calve, not only for the health of the calves but to prevent a potentially lethal ailment caused by calcium-deficiency, called "milk fever." About 20-30 percent of the oat hay used by North Bay dairies is purchased locally; the remainder generally comes from Sacramento Valley or from Nevada.

Waste management demands a great deal of the dairy operator's time and effort (and expense). Wastes must be cleaned daily, and are either spread at certain times of the year on the dairy's own pasture and crop fields, or are disposed of elsewhere by a hired contractor. Runoff must also be managed. The problem of managing wastes can be so significant that it alone can be the limiting factor in a dairy's ability to grow.

If a dairy has a replacement program, then some of its resources will also be devoted to the "maternity ward" and to caring for the young calves before they are ready to turn onto pasture (for their first five months or so). Dairy cows generally calve year-round.

About 40 percent of dairy operators in the region grow a portion of their own feed. Dairy farming is a separate operation requiring its own crew of workers. This crew is responsible not only for preparing the fields and growing the crop or pasture, but also for handling the wastes (i.e., hauling and spreading it on the fields as fertilizer).

¹⁶ The following section was written with considerable input from Mitch Mulas, dairy owner in Sonoma County.

¹⁷ Partnership for the San Pablo Baylands, 1996a.

¹⁸ An exception to this is the young replacement stock. For the first two years, calves are brought out to graze in pasture fields. Grazing can begin just after the first rains in autumn, and lasts through March. Grazing during that time is also supplemented with oat hay. During April, May, and June, the young stock survive on the grasses alone.

Agricultural Practices: Grapes¹⁹

In upland areas adjacent to the diked baylands, soils are moderately well drained and can support more intensively farmed crops such as wine grapes. As the cost of prime vineyard lands continues to rise (due largely to the limited supply of flat, farmable lands in the Sonoma and Napa Valleys), hillside range and pasture lands in southern Sonoma and Napa Counties are undergoing extensive conversion to vineyards. Grapes grown for premium wines has replaced dairies, oat hay farming, and orchards to a significant extent in the Carneros region, a trend which is likely to continue²⁰. Grapes are also being grown in the Sears Point area south of Highway 37, in the Petaluma River area along Lakeville Highway (grapes are said to have covered this area before the Depression), and in the southern Sonoma Valley west and south of Schellville²¹.

The mild climate and frequent summer fog in the North Bay is ideal for growing cool climate grapes, and their relatively low water requirements allow them to grow under the low precipitation conditions natural to this region²². In the Carneros region, mostly Chardonnay and Pinot Noir grapes are grown, though a limited amount of other varieties are also planted (such as Merlot, which is gaining popularity, and Cabernet). While some viticulturalists grow grapes under dry-land production²³, most viticulturalists do supplement rainwater with irrigation, using both surface and groundwater supplies. Some are also using reclaimed wastewater from the sanitary districts for irrigation, and many more are considering that option (it is largely a matter of establishing the infrastructure).

While the process and equipment used for growing grapes varies to a large extent by site, a typical vineyard might operate as follows. The soil may be prepared one year before the vines are planted. Dirt operations such as ripping and leveling are performed in the summer, when the soil is dry. An irrigation system will be set up, if necessary, and erosion measures will be put in place. The vines will be planted in the second year during the spring, though planting can occur as early

¹⁹ The following section was written with considerable input from Mike Morris, at Domaine Chandon Vineyard in the Carneros district, Sonoma County, and from Ann Kraemer, vineyard manager and consultant, Sonoma County.

²⁰ This depends on land prices, the ability to get water, and the market for grapes. It is generally thought that the "best" grape growing properties have been cultivated; expansion, therefore, means growing grapes under more compromised conditions. Viticulturalists are beginning to experiment with the less suitable soils, and with rootstocks which require less water. This may allow many more acres of land in the North Bay to be converted to vineyards, but how successful they are will be largely determined during the "gluts" in the grape market, when only those areas producing superior grapes will remain economic (Ann Kraemer, personal communication).

²¹ Partnership for the San Pablo Baylands, 1996a.

²² Annual precipitation in the North Bay generally ranges from 20-35 inches, almost all of which falls between November and April.

²³ Some rootstocks require relatively little water. Also, some soils actually hold too much water, and viticulturalists plant cover crops just to soak up excess water. This is the case in some places along the Napa River where the soils are deep (Ann Kraemer, personal communication).

as February and until as late as August, depending on the maturity of the plant (i.e., whether it is dormant or living). In the third year, the new vines are "trained," allowing them to become established. And in the fourth year, the young vines will produce a partial crop.

Grapes from the established vines are harvested round the clock for several weeks from August through October (harvest for sparkling wine grapes generally begins in August, and for still wine grapes, in September). Throughout the cold and wet winter months after the leaves have fallen and the plants are dormant, the vines are pruned and the trellises repaired. Irrigation systems are attended to. In the spring, the winter vegetation is chopped²⁴, and the soils are prepared once again for planting. Most vineyards generally plant some new vines every year.

The Economic Value of Agriculture

Agriculture provides important economic benefits to North Bay communities. In 1996, total gross agricultural sales for the four North Bay counties combined were over \$815 million²⁵.

Wine grapes brought in the most revenue for any one crop, and was the primary crop for the counties of Sonoma and Napa in 1996 (valued at \$327.2 million for those two counties combined). Though much of the wine production is outside the planning area, the Carneros region is an area of growing importance in the North Bay wine industry. Dairy is the largest industry in Marin County (market milk grossed \$37.7 million in sales in 1996), followed by livestock production (\$8.5 million). Much of this activity is, however, outside of the planning area in West Marin County. In Solano County, tomatoes had the highest production value of any single crop in 1996 (\$39 million), though field crops combined grossed \$79 million. Note that this production, however, is all outside of the planning area.

The table below highlights the production values for some of the more important crops in the Counties of Marin, Napa, Sonoma, and Solano.

²⁴ Some viticulturalists will chop, some will till, and some will do a combination of both. Sheep are very effective grazers, and are also used by some grape growers for mowing during the winter. Many grape growers also apply contact herbicides (e.g., Roundup).

²⁵ This and the following economic information is from each of the County's 1996 annual crop reports.

Table 3
1996 Production Values for Selected Crops (in Dollars) for Entire Counties

	Marin	Napa	Sonoma	Solano	TOTAL
Market milk	\$36,825,000	\$417,000	\$83,877,800	\$4,030,300	\$125,150,100
Fruit & nut ²⁶	1,334,013	151,780,000	187,358,800	31,591,600	372,064,413
Wine grapes		151,595,000	175,572,200	13,495,400	340,662,600
Livestock, poultry, & aquaculture	11,010,948	2,452,000	40,449,200	20,614,800	74,526,948
Field crops ²⁷	5,762,643	679,000	7,633,700	79,077,700	93,153,043
Nursery products	575,467	2,181,000	33,078,300	22,347,700	58,182,467
Vegetables	(see note)	186,000	19,519,200	44,472,200	64,177,400
TOTAL AG²⁸	\$56,409,423	\$157,822,000	\$389,571,200	\$211,630,700	\$815,433,323

In the planning area for the North Bay Wetlands and Agriculture Protection Program, and particularly on diked baylands, agricultural production consists mainly of field crops (with the noted exception of the Carneros region, which produces mainly wine grapes and is almost all upland, not part of the diked baylands). The gross sales value of field crops for the four counties combined in 1996 was over \$93 million.

The economic value of field crop production in the North Bay is actually much higher than that figure suggests, however. North Bay dairies depend on these local field crops for part of their feed supply²⁹. The loss of extensive agriculture lands in the North Bay would raise the cost of forage for local dairies, since they would be forced to purchase all of their feed from nonlocal suppliers with added transportation fees. Since feed costs represent about 60 percent of dairy operating costs³⁰, the added transportation fees could have a noticeable effect on the dairies' bottom lines.

Note also that gross agricultural revenues tell only one part of the economic story. Agriculture stimulates additional economic activity in the region through related supplies and service industries, and provides an important source of local jobs. In Solano County, for example, the processing of agricultural products accounts for 63 percent of agricultural jobs. Adding the total sales of both

²⁶ Wine grapes are included within this total dollar value. For Marin, this category also includes vegetables.

²⁷ This includes mainly hay, oats, irrigated pasture, range, silage, and similar field crops. For Solano County, this category also includes dry edible beans (\$4.8M), field corn (\$15.3M), and sugar beets (\$5.7M).

²⁸ Gross value of total agricultural production for each county. Since not all crops are shown, totals may not equal the sum of the crop values in this chart. Furthermore, due to different classification systems, crops may be shown twice. For example, in Sonoma County, wine grapes are also included as part of the fruit and nut totals.

²⁹ Local field crops (mostly oat hay) constitutes about 20-30 percent of the feed supply used by local dairies (Mitch Mulas, personal communication).

³⁰ Partnership for the San Pablo Baylands, 1996a.

agricultural production and processing to indirect sales which are stimulated by agriculture, the economic value of agriculture is increased by over 50 percent. It has been determined that \$3.50 of personal income is created by agriculturally related jobs for every \$1 of total gross value of agricultural production³¹.

Furthermore, the scenic beauty of farmland attracts tourism, which is a major contributor to the region's economy. For example, visitors to Marin, Napa, Sonoma, and Solano left behind \$1.7 billion in those counties in 1994³².

Habitat Value

While economic value is an important benefit of agriculture in the North Bay, it is not by any means the only benefit. North Bay agricultural lands provide important habitat for wildlife. The value of many farmlands (particularly those on diked baylands) in providing seasonal wetland habitat is discussed at length in Chapter 3. However, the importance of agricultural land as dryland habitat is also significant. Many species of birds feed on seeds and insects in the fields. Small and large mammals (deer, raccoons, fox, coyote, etc.), reptiles, and amphibians inhabit the pasture land. Raptors (birds of prey) hunt in the fields, and sometimes find rest in perch boxes constructed by farmers. Upland predators use farmed and grazed baylands for roosting and nesting. And wetland species depend on these low-lying farmed areas for refuge and food when high tides inundate the normally exposed marshes or mudflats, or during heavy rains³³.

Many farmers enjoy having wildlife on their lands, and some manage their property specifically to attract the wildlife. Appendix A describes several "wildlife-friendly" practices for farmers who may be interested in providing wildlife habitat to attract more wildlife to their farms (while at the same time avoiding problems with the Endangered Species Act)³⁴.

Regional Open Space

As suburban sprawl continues to engulf rural areas in the Bay Area, agriculture also provides important value as open space. Agricultural lands frequently act as separators between communities, maintaining community identity and the rural character of the region. Agricultural lands, as open space, also contribute air quality benefits, allow for groundwater recharge, act as buffers for nearby environmentally sensitive areas, and can provide opportunities for sewage disposal³⁵.

³¹ Solano County Agricultural Report, 1996.

³² Partnership for the San Pablo Baylands, 1996b.

³³ Ibid.

³⁴ These practices, several of which are summarized in Appendix A, are presented in greater detail in the publication *Farming for Wildlife: Voluntary Practices for Attracting Wildlife to Your Farm*, written by Jeanne Clark and Glenn Rollins (April 1997).

³⁵ People for Open Space, 1980b.

Farmland is very much a part of the North Bay's identity, and is largely what makes it such a nice place to live. For city dwellers and suburbanites as well, rural areas offer beauty and retreat. And as demonstrated by the substantial number of dollars left behind by tourists in each of the four North Bay counties, they are willing to pay for it!

Farming Culture

The lifestyle associated with farming is considered by many to be of great value in and of itself. It is a lifestyle born of working close to the earth, and defined by hard work and commitment. For many farming families in the North Bay, it is a tradition that has been passed down for several generations.

The chart in the following page provides some characteristics about the farms and their operators in the counties of Marin, Sonoma, Napa, and Solano. Note that the majority of farms in each of the four counties are operated by full owners, and most farms are under individual or family ownership (corporations own only 5-10 percent of the farms, and the vast majority of these are family corporations). The average number of years that operators have spent on their current farm ranges between 15-19 years. The average size of farm varies between the counties, from 189 acres in Sonoma to 650 acres in Marin (the state average is 373 acres); clearly the farm size is greater where extensive agriculture is more widely practiced, i.e., in Marin and Solano.

Table 4
Farm Ownership and Operators in the North Bay Counties³⁶

	Marin	Sonoma	Napa	Solano
Avg. farm size	650 acres	189 acres	192 acres	400 acres
Ownership:				
Full owners	52%	75%	82%	66%
Part owners	20%	13%	11%	18%
Tenants	28%	12%	7%	16%
Indiv or Family	70%	81%	71%	80%
Partnership	21%	13%	19%	14%
Corporation:				
Family	7%	5%	7%	4%
Non-Family	2%	1%	3%	1%
Operators:				
Average years on current farm	19	17	15	16
Average age	55	56	58	55

³⁶ The above statistics were taken from the 1992 Census of Agriculture, U.S. Department of Commerce, Bureau of the Census, Washington, D.C.

There is an entire culture associated with farming, a culture which finds high expression in county fairs and farm festivals. The farming culture adds great value to the rest of society. Many feel it is worth preserving for that contribution alone.

CHAPTER 3

HOW PROTECTING AGRICULTURE HELPS PROTECT WETLANDS

There is a close interrelationship between agriculture use of land in the North Bay and wetland functions and values. Protecting agriculture in the North Bay serves to protect wetlands in several ways:

- Besides providing important habitat and feeding grounds for terrestrial wildlife, many farmlands also function as seasonal wetlands during the rainy season.
- Farmlands act as buffers between urban areas or highways and nearby wetlands.
- Urban uses, such as high density residential, commercial, and industrial land uses displace wetlands and are destructive to wildlife. While many agricultural practices can also be harmful to wetlands and certain wildlife, agriculture is far more compatible with wetlands, and in turn many wetland functions are compatible with agricultural uses.
- In addition, maintaining agriculture on diked baylands leaves open the possibility of future restoration to tidal wetlands, if and when that should occur. More intensive development of those lands would foreclose that option.

Approximately 27,000 acres of the land farmed or grazed in the North Bay planning area were once tidal wetlands³⁷. Diked, ditched, and drained for agricultural purposes in the late 19th century, the majority of the farmed baylands in the North Bay require extensive networks of levees, ditches and pumps to prevent flooding and to manage groundwater and salt levels³⁸.

While most of the year these farmlands function as dry upland areas, many of these lands function as seasonal wetlands during the rainy season. Wetland vegetation often grows in low-lying areas where rainwater and seepage pool³⁹. Drainage and irrigation channels also frequently support wetland vegetation⁴⁰. Besides the seasonal wetland habitat which develops naturally, some

³⁷ See Appendix B for an explanation of how these figures were derived.

³⁸ San Francisco Estuary Institute, 1994.

³⁹ The elevation of these diked farmed baylands is often significantly lower than the adjacent tidal waters (ranging from four to nine feet below Mean Higher High Water), due to consolidation, subsidence, and wind erosion (San Francisco Estuary Project, 1992).

⁴⁰ San Francisco Estuary Project, 1991a.

farmers may deliberately flood their fields in the winter to control pests and to leach salts, or in the fall for duck hunting⁴¹. Historical farming practices that left oat hay stubble in the field after harvest and allowed ponding in the late summer and early fall, for instance, would attract migratory waterfowl such as dabbling ducks and Canada geese⁴².

The seasonal wetlands that develop or are created on agricultural fields in the North Bay serve an important ecological function. Seasonal wetlands provide resting areas for wintering and migrating waterfowl, alternative feeding habitat for waterfowl dependent on wetland habitats, and are breeding grounds for many species of birds and great numbers of amphibians. Small shorebirds use these ponds to rest and feed when high tides cover adjacent mudflats, while larger shorebirds use seasonal wetlands as roosting areas⁴³.

The seasonal wetlands which form on diked agricultural baylands have particular significance, since most of the original seasonal wetlands in the North Bay (which occurred further inland, historically) are now gone. While most of the diked agricultural baylands in the North Bay were not formerly seasonal wetlands but rather tidal, brackish, or freshwater marshes, the wetlands which now form on those lands have taken over some of the important ecological functions once served by the historical seasonal wetlands.

Farms on diked baylands in the North Bay not only contribute wetland habitat (as seasonal wetlands), but often provide buffers between urban land uses and tidal marshes and mudflats, and the Bay. As buffers, they help protect environmentally sensitive wetland areas from the impacts of noise, excessive or unnatural light, physical disruption, pollution, or other impacts of human society. Agricultural lands may also serve as corridors for wildlife movement in and out of the wetland areas⁴⁴.

Some have argued that a most compelling reason for protecting and supporting agriculture in the North Bay, at least in terms of the specific benefits for wetlands and wildlife, is that agriculture is far more compatible with wetland value than is housing, commercial strips and malls, or typical industry⁴⁵. Extensive agriculture, the most prevalent type of agricultural practice in the North Bay planning area (See Figure 2), is the most compatible land use with wetlands, second only to wildlife areas⁴⁶. Moreover, farmed and grazed diked baylands have been found to be particularly of high value as habitat for wildlife. The San Francisco Bay Area Wetlands Ecosystem Goals Project

⁴¹ Partnership for the San Pablo Baylands, 1996c.

⁴² San Francisco Estuary Institute, 1994.

⁴³ San Francisco Bay Conservation and Development Commission, 1983b.

⁴⁴ Ibid.

⁴⁵ Note, however, that some industrial uses can actually benefit wetlands: salt ponds create wetland habitat, and treatment ponds associated with sewage treatment plants, such as those at the Las Gallinas Valley Sanitary District, not only provide wildlife habitat, but can irrigate pasture lands and offer recreational opportunities.

⁴⁶ See the BCDC staff background report, "North Bay Land Use and Public Ownership." Extensive agriculture comprises 84 percent of lands that are farmed and grazed in the North Bay planning area. Of farmed and grazed lands in the planning area that are on diked baylands, extensive agriculture comprises practically the entire area.

has found in its research that only slightly fewer key species⁴⁷ use farmed or grazed diked baylands for breeding, foraging, and resting (the "key functions" of habitat types) than use managed wetlands: 587 key species use farmed or grazed diked baylands for these functions, while 658 key species use managed wetlands for the same functions (See Figure 3). In certain circumstances where the management of wildlife areas has suffered as a result of limited resources, some have argued that agricultural lands are actually more beneficial to wetlands and wildlife than are those refuge areas.

While it is true that certain agricultural practices can have adverse impacts on wetland habitats⁴⁸, these impacts tend to be far less destructive than other, more intensive land uses. A primary impact of urban development (including residential, commercial, and industrial uses) is the direct displacement of large acreage of wetlands by means of physical conversion of the land. Development can also fragment, isolate, or encroach on wetlands, which can trigger the loss of species diversity and population. Habitat fragmentation can be particularly devastating for wildlife species that use wetlands as corridors for movement, such as from resting areas to feeding areas or during seasonal migration, by disrupting life cycles and increasing exposure to predators. Fragmentation can also make wildlife communities more vulnerable to natural events such as droughts or floods⁴⁹. Urbanization can introduce new predators (such as household pets) and non-native plant species, which can displace native wetland species⁵⁰. Urbanization can also impact wetlands by changing water patterns and by polluting the water from urban runoff⁵¹. While agriculture may not always be as compatible with wetlands as wildlife refuges, it is generally far more compatible than urban development.

Finally, maintaining diked baylands in agricultural use holds open the option of future restoration to tidal wetlands. Once the land has been converted to urban use, restoration opportunities are effectively foreclosed.

⁴⁷ "Key species" are those species or populations of plants and animals that together could represent the overall complexity of the baylands natural community, and that could serve as indicators of local and regional baylands health. San Francisco Bay Area Ecosystem Goals Project, Progress Report, July 1977.

⁴⁸ These include: disturbances of habitat due to planting, cultivation, and mowing; destruction of streamside vegetation due to grazing and contamination of water by manure; impacts associated with levee construction and maintenance; deep-ripping and other practices that affect surface hydrology, and the effects of polluted runoff caused by pesticides, herbicides, and nutrients. Generally the more intensive the agricultural practice, the less compatible with wetlands. The Resource Conservation Districts in all four counties can offer technical assistance to farmers on how to minimize impacts by applying best management practices, such as grazing strategies and runoff controls (though many of the activities listed above are critical to agricultural production).

⁴⁹ San Francisco Estuary Project, 1991b.

⁵⁰ San Francisco Estuary Project, 1992.

⁵¹ In urban and suburban areas, impervious surface percentage increases to greater than 25%, at which point biotic integrity is known to collapse (or not be sustained) in creeks. This represents a significant indicator of water quality and reflects changes in the hydrograph (in terms of peaks, speed, discharge, and duration) and sediment transport. In agricultural lands, the impervious cover is less than one to five percent.

Figure 3

Distribution of Key Support Functions for Key Species Among Habitat Types

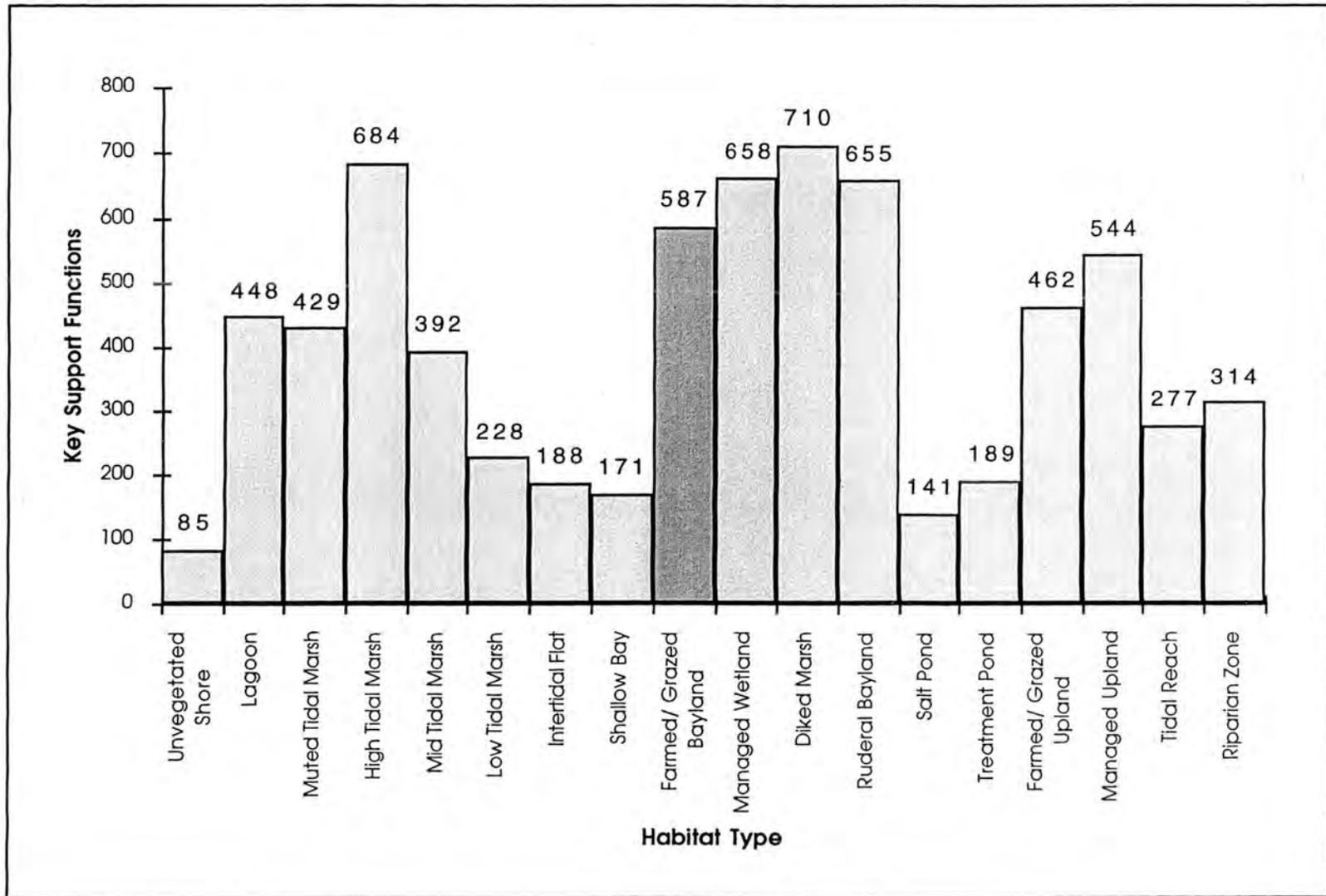


Figure 3. This chart shows the distribution of “key support functions” (that is, breeding, foraging, and resting) which are provided by different habitat types in the San Francisco Estuary baylands for key wildlife species. For example, diked marsh provides the highest level of support for key species in terms of functional use: 130 key species use diked marsh for breeding, 282 key species use that habitat for foraging, and 298 key species use it for resting. This adds up to 710 “key support functions,” as shown in the chart. Farmed/grazed bayland also provides a very high level of total support for key species (587 key support functions). (Source: San Francisco Bay Area Ecosystem Goals Project, Progress Report, July 1977.)

CHAPTER 4

OBSTACLES TO CONTINUED AGRICULTURE IN THE NORTH BAY

Farming has always been a challenging occupation, being both dependent upon and vulnerable to the forces of nature. According to many farmers in the North Bay, however, nature is the least of their worries.

Many farmers believe that what they consider to be excessive governmental regulation hinders their ability to farm their land in a manner they believe is proper agricultural management, and restricts their freedom to use their land as they see fit. Their belief is that they and their families have farmed their lands for generations, have proven to be knowledgeable and responsible stewards, and should have full freedom to make decisions about how their land is used.

While regulatory requirements may cause the most immediate frustrations for farmers, other issues may pose more serious threats to the farmer's ability to continue farming. Resource limitations, land prices, and estate taxes are among the principal obstacles. Perhaps the biggest threat to farming in the eyes of many farmers in the North Bay is not any one of these obstacles per se, but a combination of perceived obstacles and set-backs, along with the added frustration of permitting and regulatory requirements under state and federal law. Some farmers have asked whether it is all worth the effort.

This chapter takes a look at some of the problems for farmers in the North Bay, and some of their frustrations as told to BCDC staff. Of course many of these challenges and problems are shared by farmers nationally, but some are peculiar to the North Bay, particularly to farming on diked baylands.

Resource Limitations

Oat hay farming and similar extensive agriculture generally produce low profit margins. As discussed in Chapter 2, the option to grow more valuable crops is severely constrained in the North Bay diked baylands by soil conditions, a limited supply of suitable water, and lack of research.

Bayland soils, which tend to be highly acidic and saline, can be amended and enriched to produce higher value crops by adding, for example, lime or sludge. Lime is expensive, however, and has not generally proven to be cost-effective for existing crops. Sludge may contain contaminants or heavy metals which may restrict the types of crops which can be grown, and may even restrict future uses of the property.

Bayland soils also have low permeability. Poor drainage and susceptibility to flooding further limit the types of crops which can be grown. Since grapes require good drainage and cannot tolerate flooding (or for that matter, acidic soils), grape growing is not generally considered to be an option for diked bayland farmers in the North Bay. However, grapes can actually withstand some flooding while they are dormant, which happens to coincide with the winter flooding season, and one farmer is in fact experimenting with growing grapes on bayland soils.

Water supply and water quality are also problematic for farmers in the North Bay. Precipitation is low, aquifer yields are low, and upstream diversions reduce the available surface water for downstream farmers. Furthermore, in the diked baylands, surface waters and often ground waters are too brackish for agricultural use. Recycled wastewater is potentially a good source of irrigation water, but is expensive and is generally cost-effective only for nearby farms (for whom infrastructure costs would be relatively low) and for use on high value crops such as vineyards.

High Land Prices

One impediment to continued farming in the North Bay, as is common to many agricultural areas which border urban centers, is high land prices. Unable to grow more valuable crops due to water and soil limitations, one way farmers could increase profits would be to increase production by expanding their land holdings. High land prices make it very difficult for farmers to do that; it also makes it difficult or impossible for younger farmers to enter into the land market. Instead, high-priced properties are frequently bought by individuals with non-agricultural incomes⁵² and often that land is converted to non-agricultural uses or otherwise taken out of production⁵³.

When more and more lands are taken out of agricultural production, local farmers may grow increasingly uncertain about the future of agriculture in the region. Uncertainty may discourage these farmers from making long-term investments in their land and operations, or from entering the land market altogether. Also, as more and more farms are converted to non-agricultural uses, the demand for agricultural support services will diminish, and may threaten their continued services⁵⁴. This, of course, would make it increasingly difficult and expensive for the remaining farmers to continue farming.

⁵² People for Open Space, 1980a.

⁵³ Even when agricultural land is kept in agricultural use by new owners, the current trend in the North Bay is for those uses to shift from hay farms and dairies to vineyards and horse farms, largely because the profits possible from hay farms and dairies cannot compensate the high purchase prices. The hay farms and dairies in the North Bay which remain hay farms and dairies after changing hands, tend to be those passed down to family members rather than purchased externally (Bill Wright, personal communication).

⁵⁴ People for Open Space, 1980c.

Taxes

Capital gains and estate taxes, in many cases, hinder or prevent farmland from being sold to other farmers or passed down from one generation to the next.

California Farm Bureau Federation former president Bob L. Vice has summed up the capital gains tax problem as follows: "Farmers and ranchers are inhibited from selling land to younger farmers, including family members, because the gain from the sale or exchange of farmland held for long periods of time is considered a long-term capital gain," which until recent legislation signed by the President on August 5, 1997, was taxed at 28 percent⁵⁵. A high capital gains tax discourages farmers from making improvements on their operations, when those improvements would be financed by selling farm assets (which would be subject to the tax).

The new law, however, includes changes which will benefit farmers and ranchers. The recent legislation has reduced the maximum capital gains tax rate to 20 percent for sales made after May 6, 1997, if the property had been held for more than 18 months at the time of sale⁵⁶. The Act also allows taxpayers to exclude up to \$250,000 of gain realized on the sale or exchange of a principal residence occurring after May 6, 1997. This exclusion is allowed each time a taxpayer sells or exchanges a principal residence (unlike the former "one time" exclusion), although it generally cannot be claimed more frequently than once every two years⁵⁷.

The federal estate tax has widely been considered to be an even greater threat to the integrity of farmland across the nation (California does not have an estate tax). Until the recent legislation signed into law by the President, the federal estate tax law provided an exemption of \$600,000 per person of assets; beyond that amount, assets were taxed beginning at a rate of 37 percent, and increasing incrementally as the asset amount increased. Many farmers have been forced to sell the family farm because they couldn't afford to pay the high inheritance taxes. Estate taxes are particularly significant for farmers, since they tend to be asset rich (land and equipment) and cash poor.

The recent legislation (Taxpayer Relief Act, Public Law: 105-34), however, includes an additional exclusion of \$700,000 for family farms and small businesses, for a total exemption of \$1.3 million (effective in 1998). The Act will allow executors to exclude some of the value of the land from federal estate tax, when some or all of the development potential of the land has been

⁵⁵ California Farm Bureau Federation, 1997.

⁵⁶ The 20 percent tax rate is also available for property sold after May 6, 1997 and before July 29, 1997, if the property had been held for more than 12 months. In addition, the maximum tax rate for sales of property acquired after December 31, 2000 will be 18 percent, if the property had been held for more than five years at the time of sale. The new legislation also includes 25 percent for real estate depreciation recapture treated as capital gain. (Internal Revenue Service Internet homepage, www.irs.ustreas.gov/prod/hot/tax-law.html)

⁵⁷ To be eligible for this exclusion, the residence must have been owned and used as the taxpayer's principal residence for a combined period of at least two years out of the five years prior to the sale or exchange. (Internal Revenue Service Internet homepage, www.irs.ustreas.gov/prod/hot/tax-law.html)

removed through a conservation easement. In order to qualify, the property must be within 25 miles of a metropolitan area, national park, or wilderness area. The legislation provides for a maximum 40 percent exemption (limited to \$100,000 in 1998, and increasing incrementally to \$500,000 in 2002) for the value of land under a qualified easement⁵⁸.

Adjacent Land Uses

As discussed in Chapter 2, adjacent urban uses can interfere with agricultural operations. Complaints from neighbors, dogs harassing livestock, trespassing and vandalism can be particularly disruptive or damaging. All four counties have Right-to-Farm ordinances⁵⁹, but these cannot possibly resolve all conflicts.

Adjacent wildlife and open space areas, if not properly managed or maintained, can also present problems for agriculturists. Grasses which are not pastured or mowed may become a fire hazard. Levees which are not well-maintained may breach, flooding adjacent fields and potentially devastating crops. Insects or animals which naturally reside in wildlife or open space areas may cause damage to the crops in neighboring fields. Also, if endangered species inhabiting wildlife areas should begin to occupy neighboring farmland, then development activities on that farmland may become subject to the Endangered Species Act, potentially restricting the development activities on the land. Finally, wildlife and open space areas on which the public is allowed unregulated may inadvertently encourage trespassing on adjacent crop fields and pastures.

Regulatory and Permitting Issues

Many farmers in the North Bay view the regulatory and permitting process as a significant obstacle to farming. The farmers concerns are more with the federal and state regulatory process than with the local government process. Since much of the agricultural land in the planning area is "farmed wetland" and is thus subject to Clean Water Act restrictions, the U.S. Army Corps of Engineers, which administers permitting for the Act, plays a pivotal role in farming activities involving jurisdictional wetlands in the North Bay. Several other agencies also have permitting authority and other involvement affecting agriculturists in the North Bay. These agencies include the U. S. Fish and Wildlife Service, U. S. Environmental Protection Agency, California Department of Fish and Game, San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Conservation and Development Commission, and Bay Area Air Quality Management District.

⁵⁸ This information was taken from the American Farmland Trust (www.farmland.org) and The Land Trust Alliance (www.lta.org) Internet home pages, August 1997

⁵⁹ Right-to-Farm ordinances generally require disclosure to persons purchasing property in rural areas that farming activities take place in the area and noise, dust, pesticide spraying and slow-moving traffic in the area can be expected.

The following lists the major concerns expressed by farmers in the North Bay, regarding permits and regulatory agencies:

- *Permits can be expensive.* Some farmers have complained that mitigation requirement (under the federal Endangered Species Act) costs for obtaining Clean Water Act Section 404 permits can sometimes be so high as to make it infeasible to grow crops.
- *The permitting process can be unreasonably time-consuming.* Agriculturists depend to a large extent on forces outside of their control, such as the weather, and need to respond to situations as they arise. This is especially true in emergency situations, such as a levee damage, breach or overtopping. Farmers complain that the permitting process can hold up normal and necessary agricultural operations, particularly when more than one agency is involved. Permitting delays can be especially frustrating when the procedure in question is an activity which has been performed regularly on those same fields for generations.
- *Regulations may be too rigid.* Although a farmer may have no qualms with a particular regulation under normal circumstances, abnormal circumstances, they believe, may occasionally require that the regulation be modified or temporarily lifted. An agency official working with certain farmers over time may come to understand these circumstances and grant the regulatory flexibility when necessary, without requiring complicated and time-consuming paperwork. However, the rigidity of a regulation as written may become problematic for the farmer when a "seasoned" agency official has been replaced by someone new and unfamiliar with farming practices. Farmers have requested that greater flexibility be built into regulations "as written," to allow for extenuating and emergency circumstances.
- *Lack of connection between agency officials and farmers.* Related to the above concern is the sense on the part of farmers that agency officials have no real understanding of farming issues and problems, and that communication between the two parties is lacking. One farmer cited, as an example of this, maps of certain areas in the North Bay which had been drawn obviously wrong, noting that such errors would not have occurred if agency officials had greater presence in the North Bay.
- *Regulations are too complicated.* Some farmers have complained that they have been penalized for violating regulations which they had no idea existed, while performing what they had perceived to be "normal" agricultural operations. The regulations are numerous and complex, and not always obvious.
- *There are too many regulatory agencies and too much duplication of effort.* The sheer number of regulatory and planning agencies with jurisdiction or interests in the North Bay causes great confusion for those affected by their decisions. Farmers cannot always take

time away from their work to attend meetings and to keep up with regulatory changes or planning efforts; nor do they feel they should be required to do so. In addition, overlapping jurisdictions can add delays in the permitting process, as one agency waits for another to authorize work.

- *Wetlands regulations may limit the farmer's ability to switch crops.* Farmers sometimes need to switch farming patterns due to market changes or to changes in soil or other resource conditions. The inflexibility to switch crops when the need arises could threaten a farmer's viability.
- *The over-regulation of properties robs the value potential of the land.* Many farmers feel that existing regulations are too restrictive. Where regulations limit future uses of the land, the value of the land, they claim, is diminished. This can also influence the farmer's ability to obtain farm loans, since the amount which can be borrowed is based on property value.

Simply put, many farmers object to the restrictions they feel have been placed on their freedom to manage their land as they see fit. Many farmers in the North Bay concede the need for certain regulations, yet believe the existing regulations to be excessive, confusing, and poorly administered. While most farmers tend to express deep appreciation for the land and would prefer that it remain farmland rather than become, for instance, a commercial strip, their financial worth is tied up in that land, and they are not willing to "give it away." Neither do they see why they should bear the burden of preserving a public good. If the public values wildlife and open space areas, they claim, then the public should pay for it.

CHAPTER 5

PROTECTING AGRICULTURE

A variety of land use planning and control and economic incentives and assistance programs are available at the local, state and federal level to protect agriculture land. Because this study emphasizes the role of local government in agriculture and wetland protection, the thrust of the analysis in this report is on the role of local government in protecting agriculture in the North Bay and the programs they administer. In addition, the role of state and federal agencies and non profit organizations in protecting agriculture will be analyzed.

Local governments have many tools at their disposal to reserve and protect land for agricultural use. This chapter focuses on the most commonly applied tools, discusses how these tools are currently applied in the North Bay, and suggests other, similar methods of agricultural land use protection applicable to the North Bay by other levels of government and organizations.

Three kinds of agriculture protection methods will be discussed: (1) land use planning and regulation; (2) economic incentives and assistance; and (3) permit streamlining.

Land Use Planning and Regulatory Tools

In California, local government has taken the lead in protecting land for agriculture use and farming. Under California planning law, local government has the authority to employ a wide range of land use planning and regulatory tools to protect farmland. These tools include agriculture protection policies and land use designations in county and city general plans, zoning ordinances and other ordinances affecting farming. In addition, county Local Area Formation Commissions (LAFCO) protect farming by controlling the extension of cities and special districts that provide urban services on agricultural land.

States and the federal government do not normally engage in land use planning and land use regulation. However, there is ample precedence for state planning and regulation of resource areas of state-wide concern, such as Lake Tahoe, San Francisco Bay, the coast and the Suisun Marsh. Similarly, the federal government, through the U. S. Army Corps of Engineers, has provision for development of Special Area Management Plans that establish a land use planning basis for the Corps' regulatory process under the federal Clean Water Act.

General Plan Use Designations and Policies. California law requires that all cities and counties adopt a general plan. The general plan guides the county or the city's future development and serves as the basis on which all land use decisions in the jurisdiction are based. General plans apply to all lands within a city or county boundary as well as any land outside of a city but within

its Sphere of Influence as set by the county LAFCO which the city believes relates to its future growth. All land use decisions, including development proposals, approvals for subdivisions, zoning changes or development agreements made by a community, must be consistent with the general plan.

Figure 4 is a composite of the generalized general plan land use designations of the four counties and four cities in the North Bay planning area. A more detailed description of the individual general plan designations and the method by which the uses were aggregated for display and analysis can be found in the previous planning background report *North Bay Land Use and Public Ownership*, Chapters 2 and 3. What is clearly evident when viewing Figure 4 is the predominate designation of the planning area and the diked baylands within the planning area for agricultural use. The major exception to designation of diked baylands for agriculture use is in Marin County and Novato where areas are designated for open space and recreation, and in Sonoma County where the federally-owned portion of Skaggs Island is designated public facility use. Open space and recreation lands, however, can be used for agriculture uses. A detailed analysis of the county and city general plan designations can be found in Chapter 3 of the *North Bay Land Use and Public Ownership* report.

From a policy perspective, the general plans for the unincorporated area of each of the four counties recognize the importance of agriculture listing such benefits as: contribution to the local economy, jobs, visual and scenic resource, open space, providing separation between communities, lifestyle and rural character, taxable land needing fewer services, a source of energy through agricultural biomass conversion, and a destination for treated urban wastewater.

The four city general plans, on the other hand, place far less emphasis on agriculture and the importance of protecting agriculture. This is not surprising since the cities contain relatively little agriculture land. Only Novato has general plan policies regarding agriculture.

The following provides a brief summary of the general plan policies which relate to agriculture for those counties which contain significant amounts of agricultural land in the North Bay planning area—Marin, Sonoma and Napa Counties and the City of Novato.

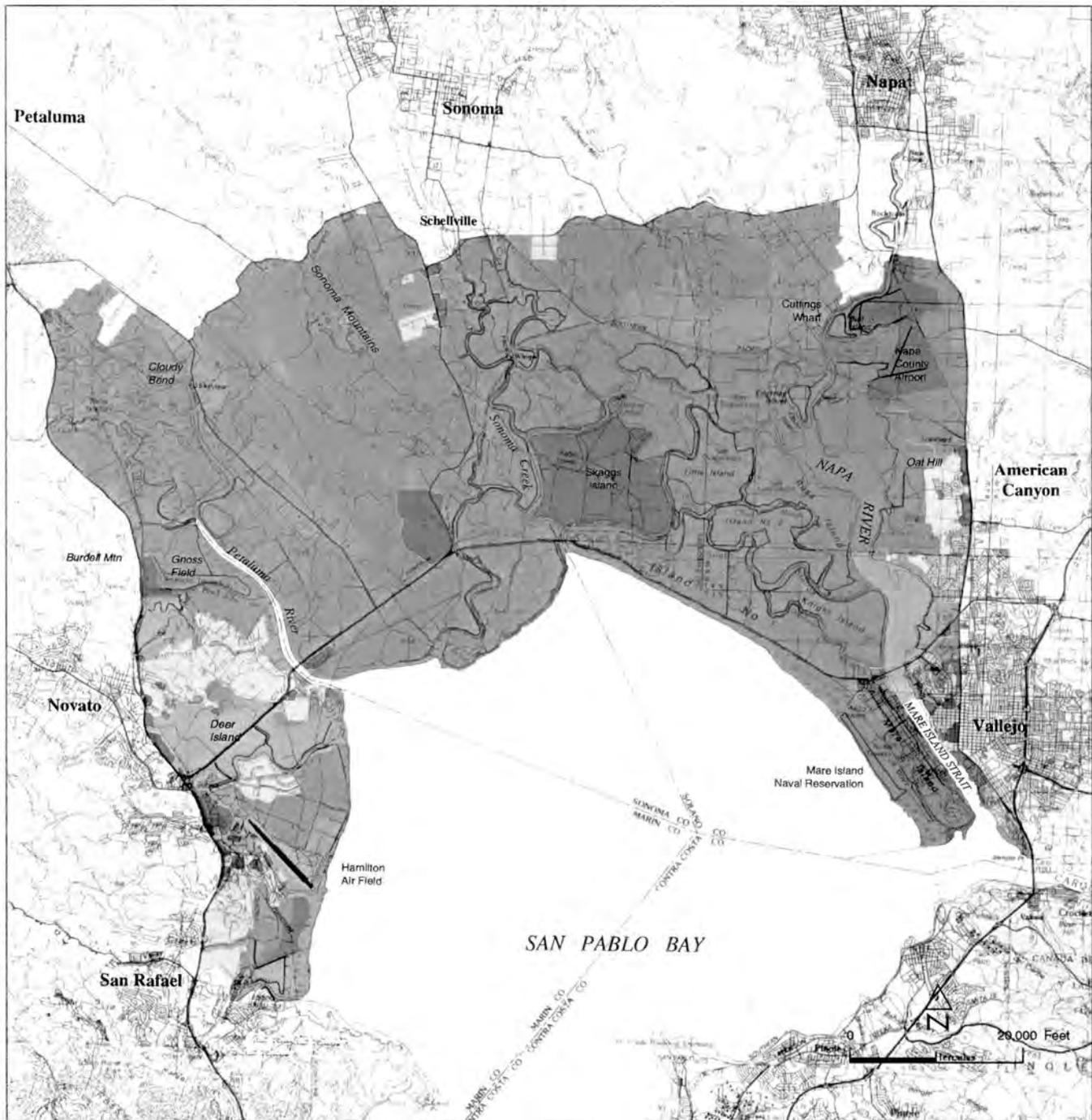
1. **Marin County.** The *Marin Countywide Plan* recognizes "the value of continued agriculture for producing food and fiber for the region and as an important component of the county's diversified economy" (page A-2). The Plan divides the county into three zones: (1) a Coastal Recreation Corridor along the Pacific coast; (2) an Inland Rural Corridor; and (3) a City-Centered Corridor in eastern Marin along Highway 101. Urban and suburban development is concentrated in the City-Centered Corridor while central and western Marin County are devoted primarily to agriculture and open space use.

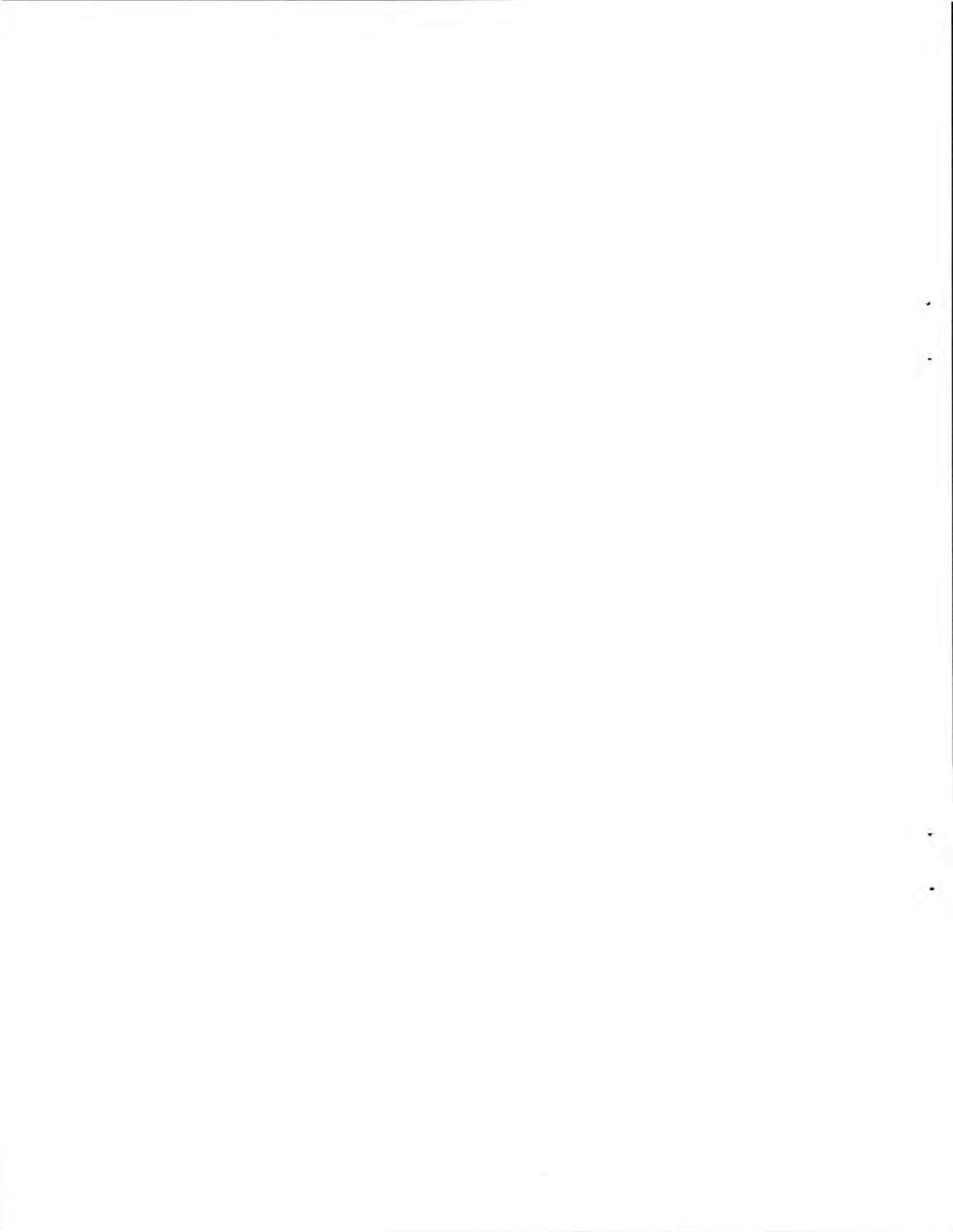
SOURCE: REGIS, 1995; BCDC

North Bay General Plan Designations

- | | | | |
|---|-------------------------------|---|-----------------------------------|
|  | Extensive Agriculture |  | Public Facilities |
|  | Intensive Agriculture |  | Open Space and Recreation |
|  | Residential |  | Open Water |
|  | Commercial and Light Industry |  | Areas Outside Study Area Boundary |
|  | Heavy Industry | | |

Note: These categories are aggregations of each city and county's general plan; thus the names of the categories may not match the designations used in each jurisdiction.





The Countywide Plan is specific about protecting agriculture. The plan's agriculture element states "preserving agricultural lands and preventing subdivision of lands under agricultural production" is a County policy (page Introduction-33). The Plan depends on several strategies for preserving agriculture (Note: many of these land use regulatory tools will be discussed later in this chapter):

a. **Low Density Zoning in the Inland Rural and Coastal Corridors.** Most of Marin's agricultural land lies within these corridors and is zoned with a minimum lot size of one unit per 60 acres (in fact, about 90% of agricultural land in the county is zoned with this density).

b. **The Williamson Act.** More than 95,000 acres of farmland are currently under Williamson Act contracts in Marin.

c. **Agricultural Conservation Easements.** The Countywide Plan encourages the continued acquisition of agricultural easements. The Marin Agricultural Land Trust (MALT) is the primary purchasing body for easements on agricultural land in Marin. About 25,500 acres are under easement at this time, however the easements are all Inland Rural and Coastal Corridor areas. MALT's Program does not extend to the eastern portion of the county.

d. **Cluster Development and Master Plan Development Standards.** Marin County adopted the agricultural zoning district ARP, or Agricultural Residential Planned District, to address concerns about the gradual conversion of agricultural lands to rural residential uses. This zoning category (applied primarily in the Nicasio Valley in the Inland Rural Corridor) requires the development of a Master Plan for any proposed commercial use of a property. The Master Plan must show how agriculture will be continued on at least 95 percent of the property, and that the commercial use will be compatible with agricultural activities on surrounding properties.

The Marin County Planning Department is currently working on a comprehensive update of the zoning code. Under consideration is the application of a uniform agricultural zone to all agricultural lands, including clustering provisions (such as those in the ARP zoning district), development standards and non-agricultural land uses.

e. **Transfer of Development Rights.** The Marin County Zoning Code allows for the transfer of development rights from properties where development would disrupt or displace agriculture, to designated areas where such development would cause less impact but could be absorbed with planned densities and intensity of land use. The usefulness of TDR's in the County has been questioned, however, since receiver-sites are difficult to find. Only one TDR transaction has taken place in Marin County (in Nicasio), and in that case, the same party owned both the receiver and the donor sites.

f. **Right-to-Farm Ordinance.** A right-to-farm ordinance was adopted by the Board of Supervisors in November 1995.

2. **City of Novato.** *The Novato General Plan* recognizes the importance of agriculture to the Novato community. One of the goals of the General Plan is to "preserve bayfront lands and diked wetlands for agriculture, resource restoration, conservation and recreation."

The Environment element contains an objective to "encourage continued agricultural use" (EN Objective 5). This includes policies to: retain or establish very low density zoning categories and to require clustering of development on lands designated for agricultural use; to assist public agencies or non-profit land trust organizations in acquiring conservation easements on agricultural lands; to develop policies and programs to protect the right to farm on agricultural land; and to coordinate with Marin County to maintain policies to protect agricultural land.

The Environment element also includes a policy to adopt a Bayfront Overlay Zone (EN Policy 11), whose purpose is to preserve and enhance natural and historic resources. While emphasis is clearly on the protection of natural habitat areas, the continuation of agricultural uses in Bayfront Areas which do not adversely affect wetlands or sensitive wildlife habitats and do not damage fish habitat are to be encouraged (EN Policy 15). The Bayfront Overlay Zone is expected to be adopted by the Planning Commission soon.

The Land Use element includes two agricultural use categories. The "Conservation" designation applies to privately-owned land that is mainly unimproved, and allows agriculture, outdoor recreation, and similar uses; density is established at one dwelling unit per 10 acres within the city. The "Agriculture" designation is intended to protect, preserve and enhance agricultural uses, and accordingly allows uses consistent with agriculture (including farm and ranch buildings, fishing and hunting clubs, flood control facilities, greenhouses, and animal hospitals); density is established at one dwelling unit per 60 acres.

Also related to agricultural protection is a goal included within the Novato General Plan to "emphasize infill rather than annexations." In addition to discouraging sprawl, such a policy lends some protection to agricultural lands which lie outside the city boundaries. However, the urban growth boundary approved by the Novato voters and discussed later in this report, is probably the most effective tool to control the urbanization of agricultural land adjacent to the City.

3. **Sonoma County.** The Sonoma County General Plan includes strong protections for agriculture. The Plan contains a separate Agricultural Resources Element, establishing policies to "insure the stability and productivity of the County's agricultural lands and industries." Those policies include:

- Assist in the marketing and promotion of Sonoma County's agricultural products. The Sonoma County Agricultural Marketing Program (SCAMP) was established in 1989 as the first countywide agricultural marketing program in the nation. By increasing the economic viability of agriculture in Sonoma, SCAMP works in part to reduce the need and incentive to subdivide or convert agricultural land to nonagricultural uses.
- Stabilize agricultural use at the urban fringe.
- Limit intrusion of new residential uses into agricultural areas, by means of the following: use voluntary purchase or transfer of development rights (TDR) programs⁶⁰; maintain the maximum amount of land in parcel sizes that a farmer would be willing to lease or buy for agricultural purposes; limit the number of clustered lots in any one area to avoid the potential conflicts associated with residential intrusion; and to the extent allowed by law, place an agricultural easement in perpetuity on the residual farming parcel(s) at the time that a subdivision occurs⁶¹.
- Mitigate conflicts between agricultural and nonagricultural uses in designated agricultural production areas (by means of the right-to-farm ordinance, adopted by the Board of Supervisors in 1989).
- Regulate the location and intensity of agriculture-related commercial and industrial uses in agricultural areas, avoiding local concentrations of any commercial or industrial uses as detrimental to the production of food, fiber and plant materials.
- Regulate the location and intensity of visitor serving commercial uses within agricultural areas, so that they promote agriculture without hindering the primary agricultural use of the land.
- Regulate housing for farm workers and farm family members so as to encourage adequate and safe lodging while producing minimal impact on farmland. In addition, work with lending institutions to develop ways to finance housing construction without encumbering the entire farm and without requiring subdivision.
- Assist in stabilizing farmer's economic situation. Policies include: voluntary programs for purchase and transfer of development rights; continued participation in the Williamson Act program; establishing programs for agricultural reuse of treated

⁶⁰ TDR programs have not been used in Sonoma County, however, and most likely will not be used in the future. The various "costs" in administering such a system seem to outweigh the potential benefits, which would be relatively low given the extent of restrictive zoning in unincorporated areas of Sonoma County (as explained by Richard Lehtinen, Permits and Resource Management, Sonoma County).

⁶¹ Conservation and open space easements are placed in perpetuity on such parcels routinely (personal communication, Richard Lehtinen, Permits and Resource Management, Sonoma County).

wastewater; and encouraging agencies to sponsor educational programs to assist farmers in financial planning.

- Streamline permit processing for agricultural uses in designated agricultural land use categories.

Agriculture is also well represented in other elements of the Sonoma County General Plan. The Land Use Element, for instance, contains several goals which affect agriculture, including: emphasizing "infill" development strategies; maintaining open space areas between communities; and retaining large parcel sizes for existing and potential agricultural lands and avoiding incompatible non-agricultural uses.

The Land Use policy for agriculture includes three agricultural use categories:

1. "Land Intensive Agriculture," with densities established between 20 and 100 acres per residential unit, and new parcels set at a minimum of 20 acres.

2. "Land Extensive Agriculture," with densities established between 60 to 320 acres per unit. Unless a property is subject to a Williamson Act contract, it can be subdivided such that one-half or three of the permitted residential lots (whichever is greater) can be clustered; these parcels can be as small as one and one-half acres but no larger than ten acres.

3. "Diverse Agriculture" includes lands where soil, climate, and water conditions support farming but where small acreage intensive farming and part time farming activities are predominant. Densities are established between 10 and 60 acres per residential unit.

4. **Napa County.** One of the stated goals of the Napa County General Plan is to "preserve agriculture, and concentrate urban uses in existing urban areas."

The intent to protect agriculture from the effects of urbanization is evident throughout the general plan, as expressed in the following statement: "The Napa Valley and surrounding area is an irreplaceable viticultural resource; the characteristics of climate, soils and hydrology that make it one of the finest grape growing regions in the world would be impossible to duplicate if one or more of these characteristics were impaired or destroyed by urbanization. The impacts of urbanization are, for all practical purposes, irreversible. Productive farmland and urbanization are not compatible" (Napa County General Plan, p. 22). Policies relating to the control of urbanization include the following:

- The term "urbanizing" is defined to include the subdivision, use, or development of any parcel of land that is not needed for the agricultural use of that parcel (Land Use Policy 4.12).

- The County will work with the Cities, special districts, and LAFCO to define and establish the limits of current and future urban expansion and development. Unincorporated land included within the Rural Urban Limit Line (of the 1983 Napa City's General Plan) will not be further urbanized without annexation to the City (Land Use Policy 4.10).
- The County will oppose the creation of special districts planned to accommodate residential projects outside existing urban areas, and will discourage proposed developments which require urban services and which are not proposed for urbanized areas (Land Use Policy 4.11).
- The County will enact and enforce regulations which will encourage the concentration of residential growth within the County's existing Cities and areas designated for urban uses on the General Plan (Land Use Policy 4.13).

The Napa County General Plan also includes a Growth Management element which implements the directives of Measure A, the Slow Growth Initiative (discussed earlier).

The Land Use element contains several policies in support of agriculture, including the following:

- Enact and enforce regulations that will retain agriculture as a major source of income and employment in Napa County.
- Evaluate the placement of permanent land use protective controls on existing agricultural preserve and potential agricultural acreage.
- Promote an agricultural support system (with such components as farm labor housing, 4-H, and agricultural education).
- Study tax assessment policies which take into account long term agricultural zoning and the fact that agricultural land uses require a minimum of public expenditure for protection and servicing.
- Develop planning concepts and zoning standards designed to minimize conflicts arising from encroachment of urban uses into agricultural areas.
- Establish minimum agricultural parcel sizes which reflect the availability of natural resources, to assure that agricultural areas can be maintained as economic units.
- Protect lands used for grazing (even though they are not considered prime soils).
- Reserve prime agricultural lands for agricultural use.

- Prohibit uses besides agriculture, agricultural processing, and related activities (such as winery tours) in an agricultural area, and regulate agricultural processing which is industrial in nature as any other industrial process.
- Protect farmers from nuisance complaints by means of a Right-to-Farm ordinance.

Within the Conservation and Open Space Element is the stated policy to provide a permanent means of preserving open space land for rangeland use by utilizing methods such as: exclusive permanent agriculture zoning; or acquisition (by purchase or lease or other receipt) of land to lease back to agriculturists. A similar policy exists regarding agricultural land, that is, to provide a permanent means of preserving open space land for agricultural production by utilizing methods such as: the Williamson Act; exclusive permanent agriculture zoning; or acquisition (by purchase or lease or other receipt) of land to lease back to agriculturists. Furthermore, Williamson Act contracts are to be encouraged for agricultural lands adjoining cities by adopting policies such as large lot zoning and urban limit lines.

The minimum parcel size for agricultural lands designated "Agricultural Resource" is 40 acres, and for lands designated "Agriculture, Watershed, and Open Space" is between 40-160 acres.

Zoning Ordinances. Zoning is the primary mechanism by which local governments regulate the use of land. Zoning divides a jurisdiction into land-use zones or districts and designates permitted, prohibited and conditional uses for those districts. Zoning can be used to allocate land use by district, minimize incompatible land uses, direct development, protect existing uses and natural resources, distribute population across districts and facilitate the provision of services. Specific regulatory tools that can be incorporated into zoning ordinances to protect sensitive areas or resources include buffer and overlay zones, large lot and cluster zoning⁶², density limitations, setbacks, interim development controls, planned unit development and subdivision regulations, and transfer of development rights (SFEP, 1992). For each zoning district, the zoning ordinance generally describes permitted uses – uses which are permitted as a matter of right – and conditional uses, uses for which a conditional use permit must be obtained. For example, in an agricultural zone, agriculture would be a permitted use, whereas another use, such as a school house, might be a conditional use which would require a conditional use permit.

Agricultural protection zoning establishes agriculture as the primary use and discourages or prohibits land uses that are incompatible with agriculture. According to the American Farmland Trust, these zones can stabilize the agricultural land base by keeping large tracts of land free of

⁶² Cluster zoning encourages or requires homes to be clustered onto a portion of the site, in order to protect the remainder of the site for agriculture, wetlands, or open space. This technique protects agricultural lands while allowing development. However, cluster zoning developments can be problematic because of access and ownership issues, residential objections to farming, and because the protected portion may not be large enough for farmers to operate efficiently.

non-farm development, thus reducing conflicts by non-farming neighbors, protecting a critical mass of farmland, limiting land speculation to keep land affordable to farmers, and promoting orderly growth (American Farmland Trust web site, 1998). However, rezoning of land to an agriculture zone can be controversial because the potential changes in land intensity may reduce the land speculative value. Most of the existing agricultural lands in the planning area are zoned for uses and densities which are compatible with continued agriculture; however, some of those lands are zoned for incompatible uses or densities, such as industrial or commercial use, or high-density residential development. The following describes the existing zoning for those agricultural lands within the planning area which are also diked baylands.

1. **Marin County.** There are 5,314 acres of agricultural land in the unincorporated Marin County portion of the North Bay planning area⁶³. The majority of this land (3,674 acres) lies within the historic baylands, and is used primarily for pasture and for cultivating oat hay.

As discussed above, the *Marin Countywide Plan* establishes strong protections for agriculture within central and western Marin, however, the agricultural land in eastern Marin County, the City-Centered Corridor is in a less restrictive zoning district in the sense that a density of housing is permitted on the land if consistent with an overlay Bayfront Conservation District criteria.

Of the 3,674 acres of farmed or grazed diked baylands in the unincorporated Marin portion of the North Bay planning area, 490 acres are zoned low density (that is, one dwelling unit per 60 acres), and 5 acres are zoned open area. The remaining 3,200 acres of existing agricultural lands are zoned higher density, and for uses that are generally considered incompatible with both agriculture and wetlands. The following table and Figure 5 show how these agricultural baylands are currently zoned.

⁶³ See Appendix B for an explanation of the land use classification system used for this report, based on land use maps and information developed by the U.S. Geological Survey, the Association of Bay Area Governments, and the San Francisco Estuary Institute.

Table 5

Marin County Zoning of Farmed Baylands

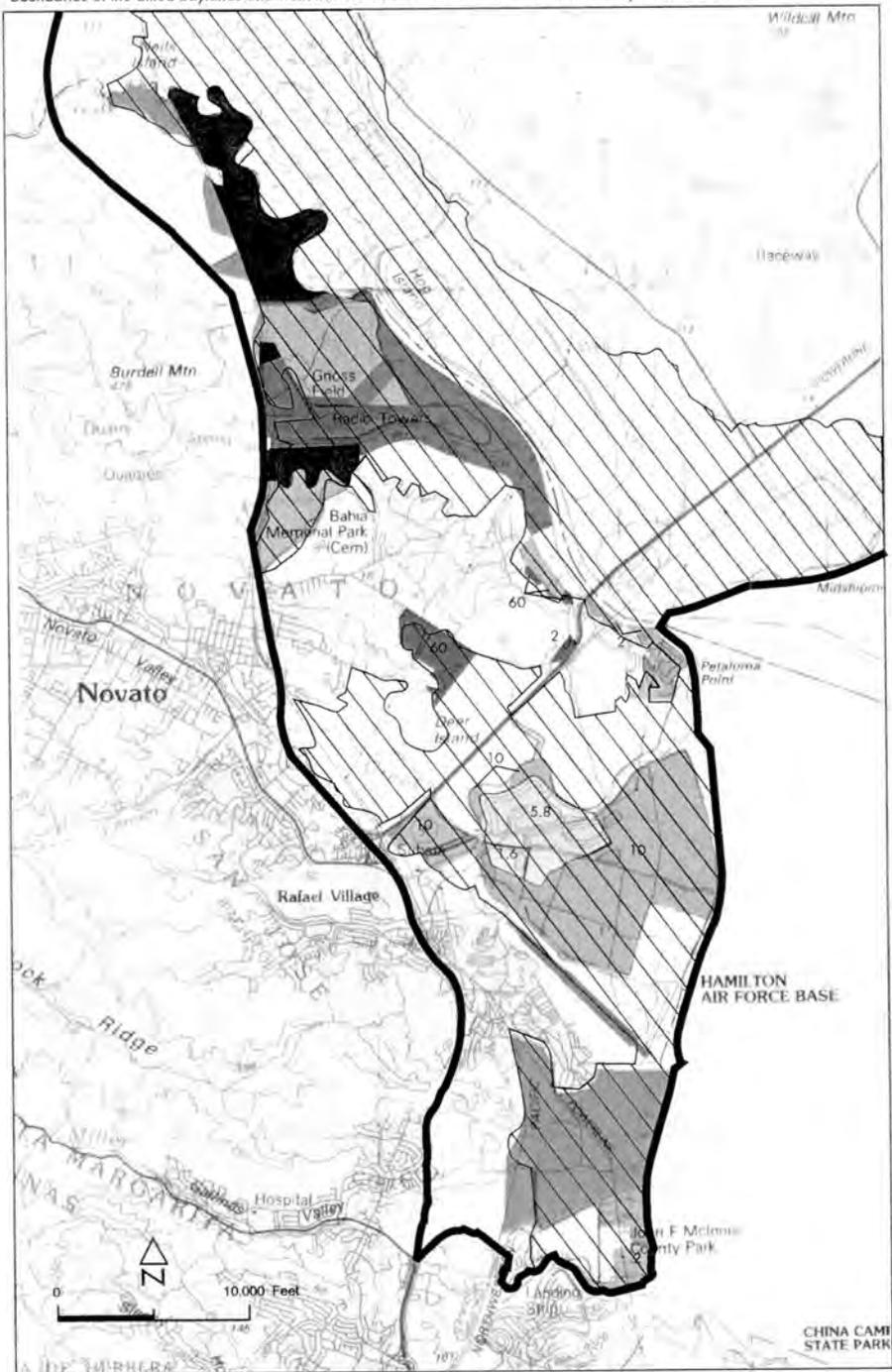
Zoning District	Acres	Explanation
A-2/ARP-2	880	Limited Agriculture/Agriculture, Residential Planned: 1 unit per 2 acres
BFC-RSP	1600	Bayfront Conservation/ Residential, One Family Planned
BFC-ARP10	220	Bayfront Conservation/ Agriculture, Residential Planned: 1 unit per 10 acres
M-3	350	Planned Industrial
RCR	140	Resort and Commercial Recreation
O-A	10	Open Area
ARP-60/AG-60	490	Agriculture, Residential Planned; Agriculture and Conservation: 1 unit per 60 acres

SOURCE: Adapted from City and County Zoning Maps, General Plans, and the San Francisco Estuary Institute Draft EcoAtlas Map.

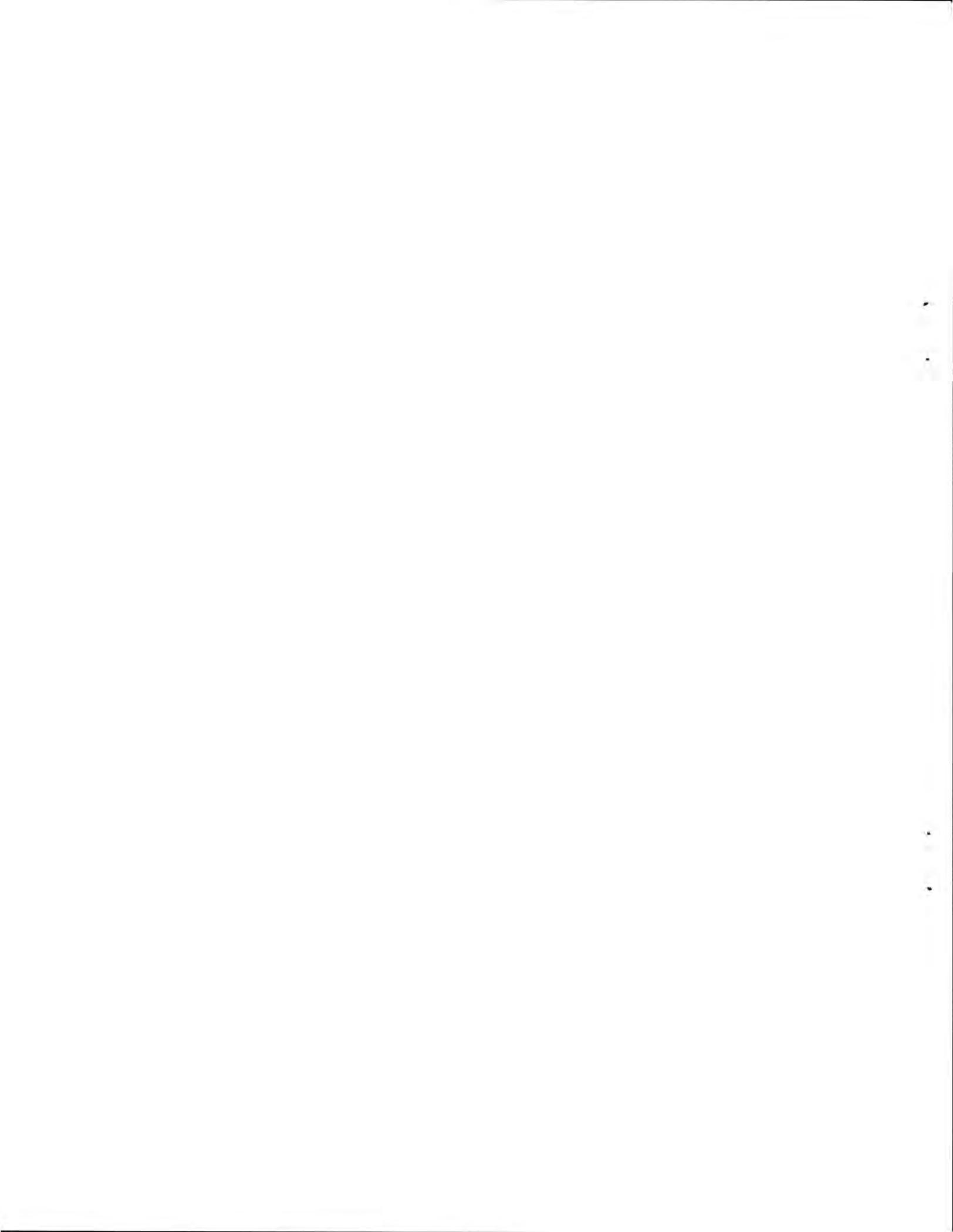
Marin County Zoning for Tidal Areas and Diked Baylands* within the Study Area



*Boundaries of the diked baylands and wetlands are derived from the San Francisco Estuary Institute EcoAtlas.



(These maps represent generalized views of the zoning for diked baylands and wetlands. To find out the specific zoning of a particular parcel, refer to your city or county's zoning maps.)



Although agricultural lands in the City-Centered Corridor do not benefit from many of the protections provided to agricultural lands in central and western Marin⁶⁴, much of it (1,818 acres) does fall within a special overlay zoning district, the Bayfront Conservation Zone (BFC). The purpose of the BFC overlay district is primarily to protect the wildlife and aquatic habitats found in Marin bayfront lands; however, BFC policies also include, specifically, the protection of existing agricultural lands (Policy EQ-2.58 in the Marin Countywide Plan). The importance of these agricultural lands are explicitly recognized as being a visual and scenic resource, as well as a productive economic resource; as playing an integral role in other agricultural and dairy operations in the County; and as being compatible with water-related wildlife habitat. The amount and type of protection given to an agricultural property in the BFC district would depend in large part on how viable the agricultural operation is. Protection measures could include clustering development in order to allow agriculture to continue on the remaining portion of the property.

2. **City of Novato.** Most agricultural activity in the Novato area takes place outside of city limits, though some agricultural lands do lie within the incorporated city. There are currently 1,970 acres of farmland within the planning area portion of Novato, almost all of which (1,828 acres) are diked baylands used primarily for grazing and for oat hay production.

Of the 1,828 acres of agricultural land in Novato which are also diked baylands, 930 acres are zoned low density (one unit per 60 acres) and 10 acres are zoned with "floodway" protections (which prohibits the construction of buildings or structures, and prohibits or limits dredging, filling, levee or dike construction, depending on the floodway protection level). The remaining 900 acres are zoned for residential, commercial, and industrial uses as shown below in Table 6 and Figure 6.

⁶⁴ Such as low density zoning, agricultural conservation easements, or Transfer of Development Rights.

Table 6

Novato Zoning of Farmed Baylands

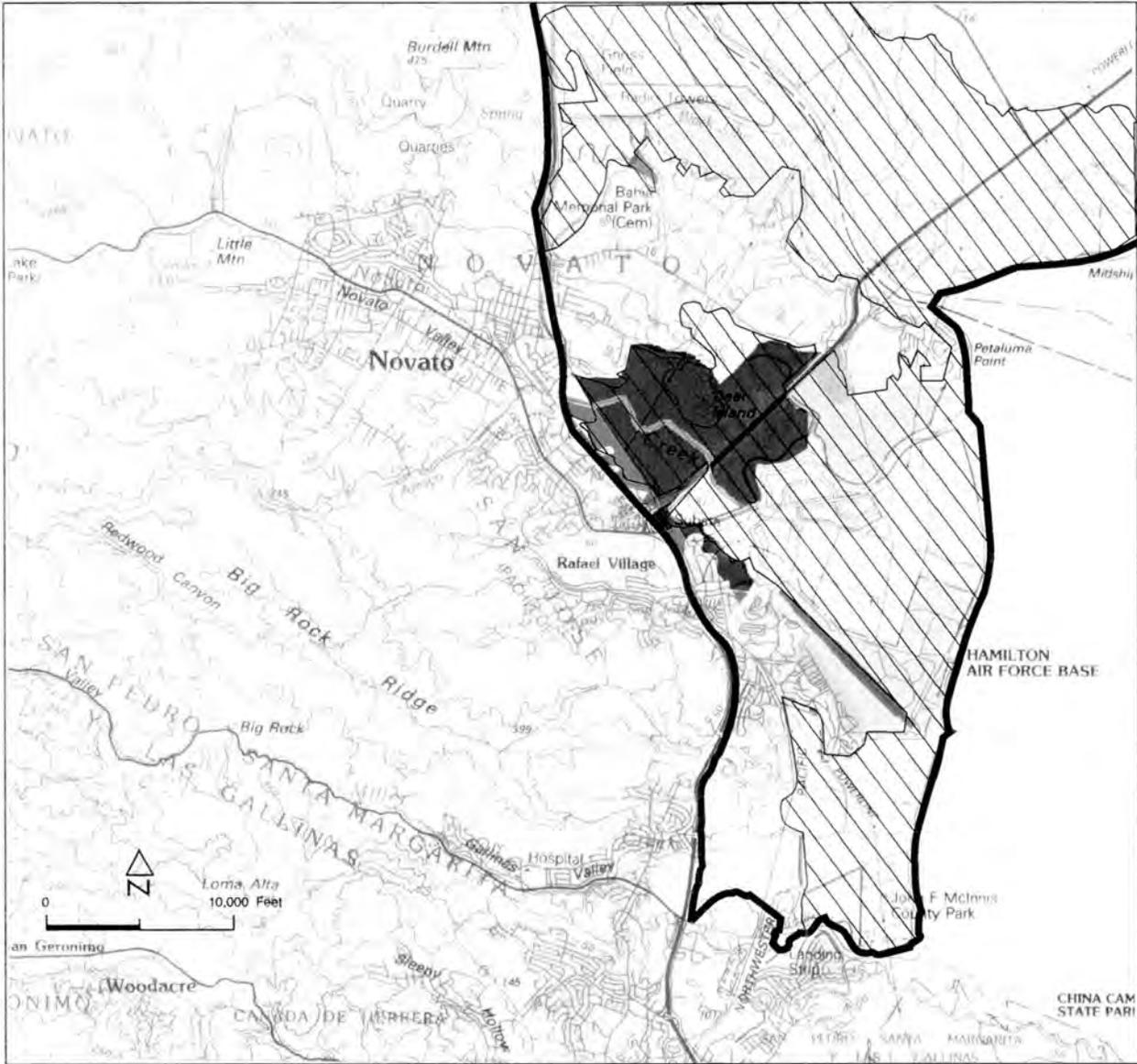
Zoning District	Acres	Explanation
P-C	820	Planned Community
RP/R-1/RSP	10	RP: Planned Residential R-1: One-family Residential (7500 sq. ft. minimum) RSP: Planned Single Family
C-P	10	Planned Commercial
M-P	30	Planned Industrial
P-C-R	30	Planned Commercial Recreation
F-I	10	Floodway
AG-60	930	Agriculture

SOURCE: Adapted from City and County Zoning Maps, General Plans, and the San Francisco Estuary Institute Draft EcoAtlas Map.

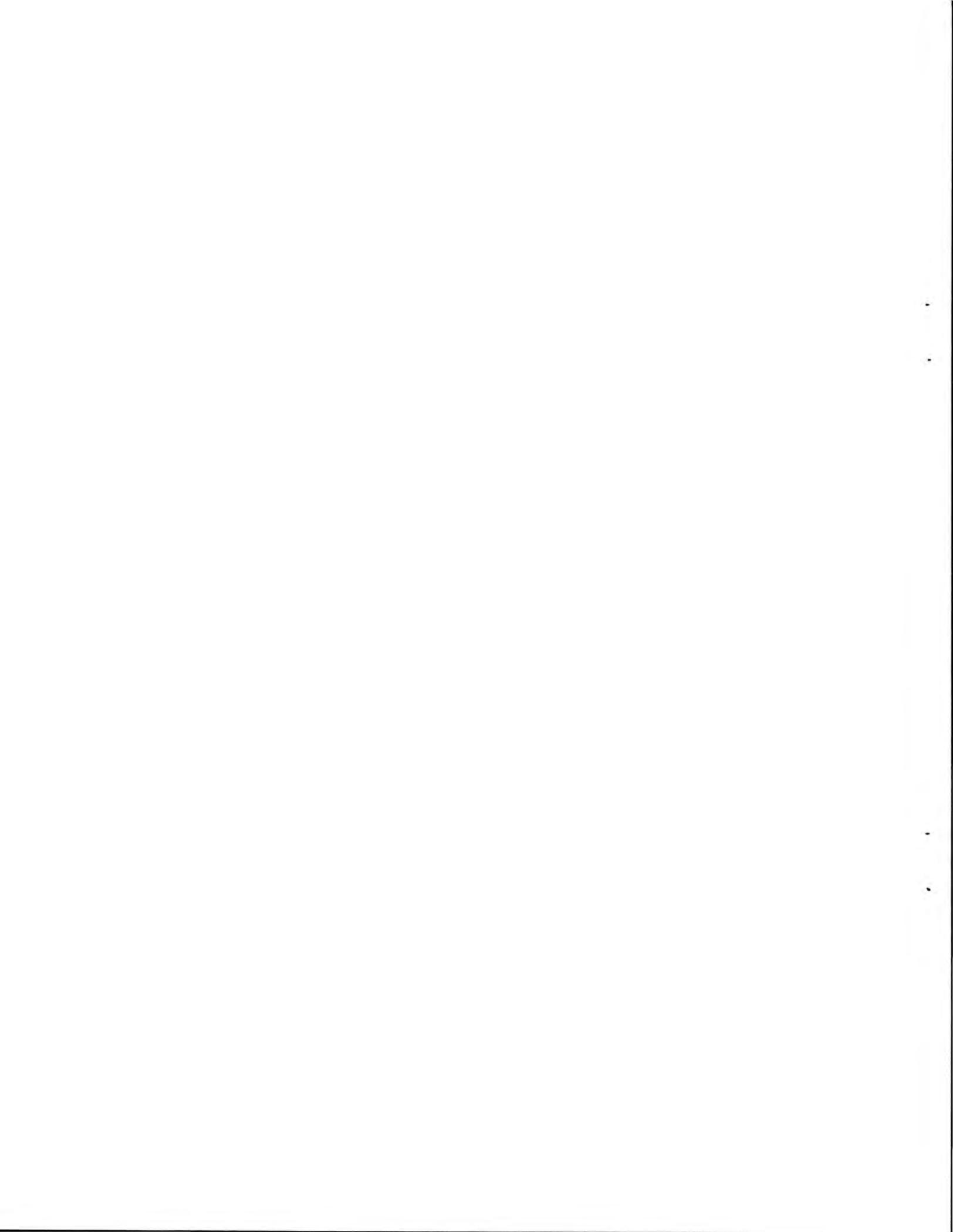
Novato Zoning for Tidal Areas and Diked Baylands* within the Study Area

-  Limited Agriculture/Planned Community (A-60:PC)
-  Agriculture (AG-60)
-  Planned Commercial (C-P)
-  Combining Floodway (F-1)
-  Planned Industrial (M-P)
-  Planned Community (P-C)
-  Planned Commercial Recreation (PCR)
-  Historic Margins of Marshlands (Nichols & Wright)
-  North Bay Planning Area Boundary

*Boundaries of the diked baylands and wetlands are derived from the San Francisco Estuary Institute EcoAtlas.



(These maps represent generalized views of the zoning for diked baylands and wetlands. To find out the specific zoning of a particular parcel, refer to your city or county's zoning maps.)



3. **Sonoma County.** There are 43,730 acres of agricultural land in the unincorporated portion of Sonoma County in the North Bay planning area. Almost half of this land lies within the diked baylands, and is used primarily for cultivating oat hay crops.

Of the 20,390 acres of agricultural lands that are diked baylands, 17,170 acres are zoned low or very low density (that is, one dwelling unit per 60, 100 or 160 acres), and 70 acres are zoned medium-low density (one dwelling unit per 20 or 30 acres).

There are 3,100 acres of agricultural land zoned "public facilities," which consists almost entirely of the federally-owned portion of Skaggs Island.

Only 50 acres of the existing 20,390 acres of agricultural diked baylands in Sonoma are zoned for commercial uses at the northwest edge of the planning area close to Petaluma. This information is summarized in Table 7 and Figure 7 below.

Table 7

Sonoma County Zoning of Farmed Baylands

Zoning District	Acres	Explanation
Rec Vis/Gen/Lim Commercial	50	Recreation Visitor Serving Commercial; and General and Limited Commercial
DA20-SR/ DA20/30	70	Diverse Agriculture, one dwelling unit per 20 or 30 acres
Public Fac	3,100	Public Facilities
LEA-60/100/160 RRD-100	17,170	Land Extensive Agriculture: one dwelling unit per 60, 100, or 160 acres; Resource and Rural Development: one dwelling unit per 100 acres.

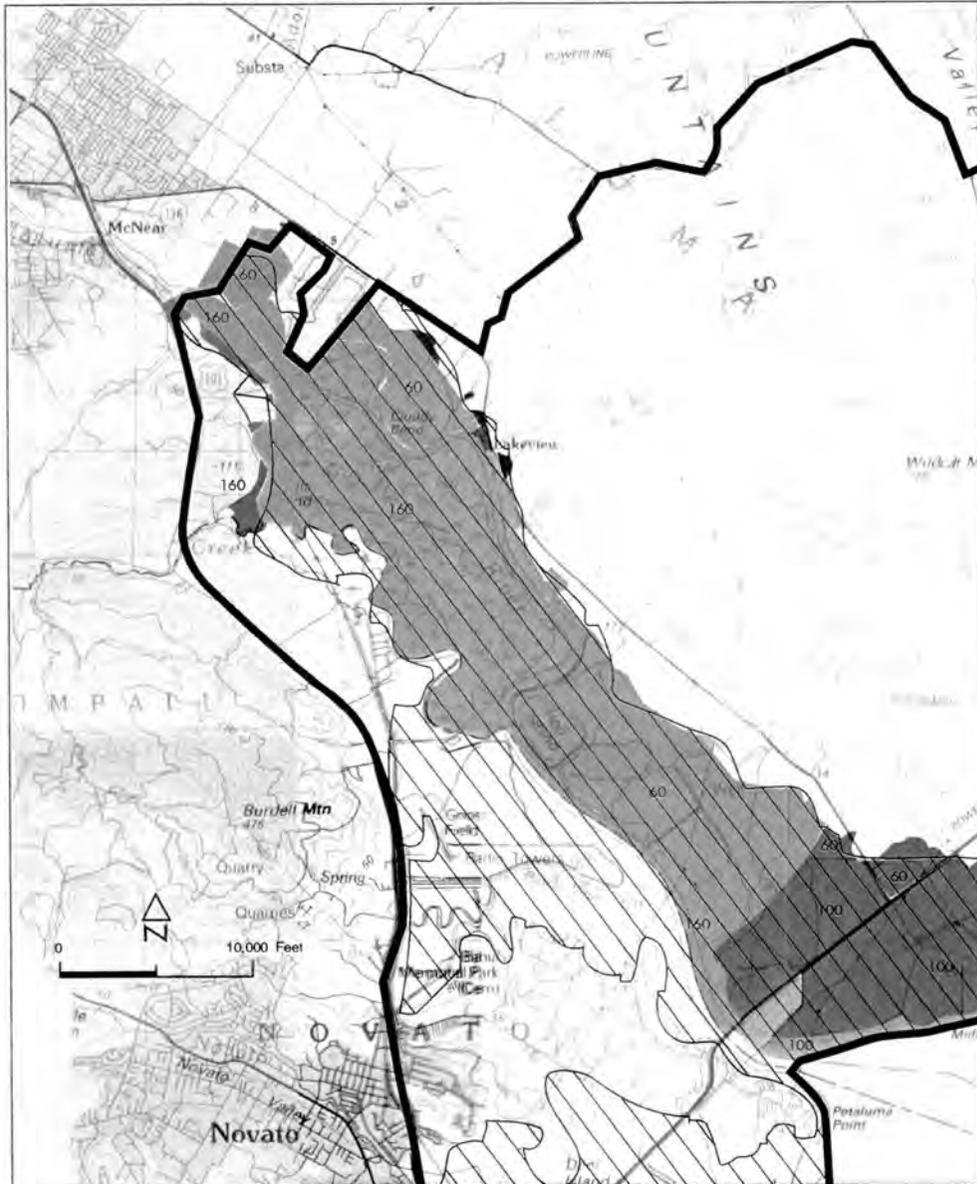
SOURCE: Adapted from City and County Zoning Maps, General Plans, and the San Francisco Estuary Institute Draft EcoAtlas Map.

Sonoma County Zoning for Tidal Areas and Diked Baylands* within the Study Area

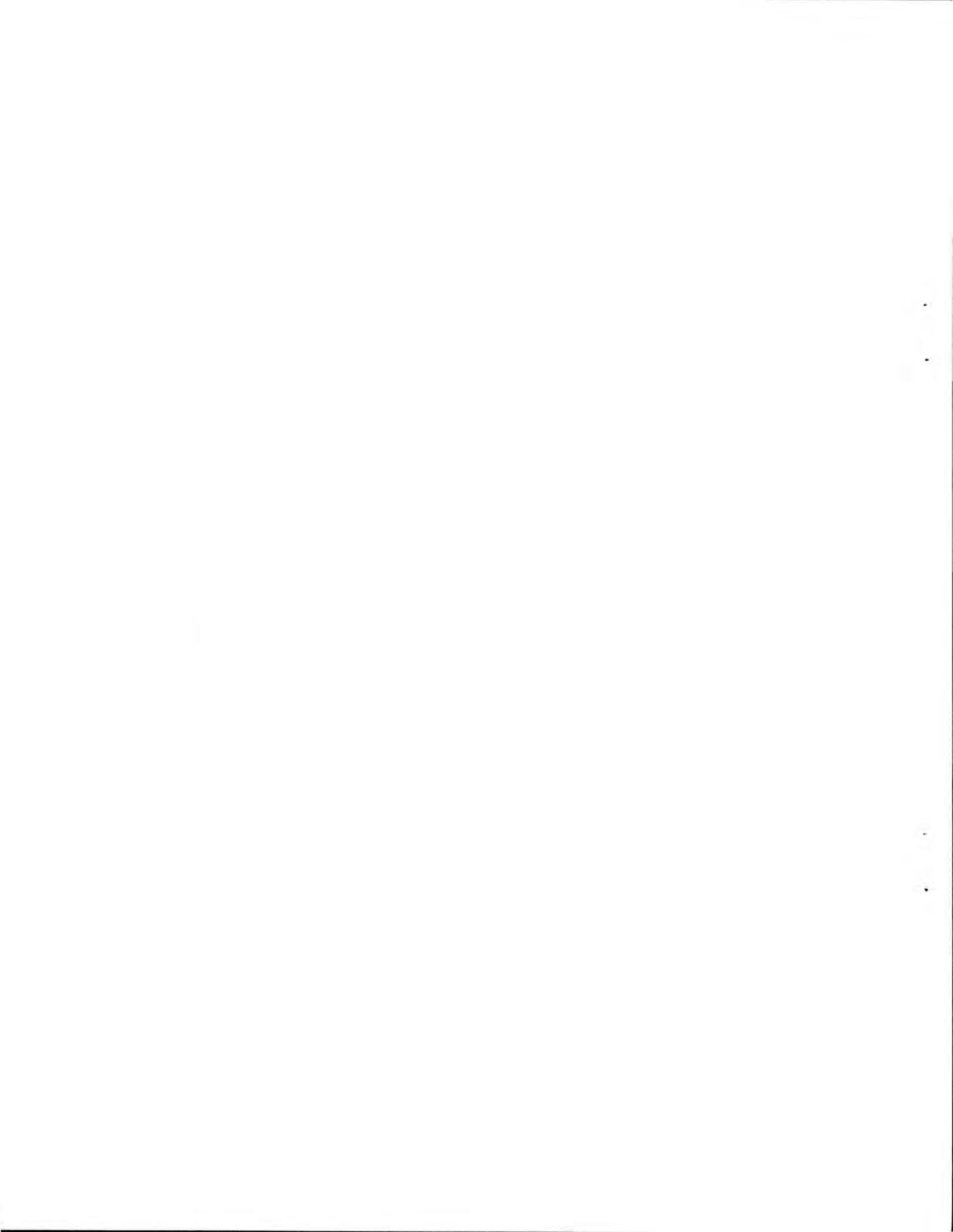
- | | | | |
|---|---|---|---|
|  | Diverse Agriculture (DA) |  | General Commercial |
|  | Land Extensive Agriculture (LEA-100) |  | Limited Commercial |
|  | Land Extensive Agriculture (LEA-160) |  | Recreation Visitor Serving Commercial |
|  | Land Extensive Agriculture (LEA-60) |  | Public Facilities |
|  | Land Extensive Agriculture/Biotic Resources (LEA-100-BR) |  | Historic Margins of Marshlands (Nichols & Wright) |
|  | Land Extensive Agriculture/Biotic Resources (LEA-160-BR) |  | North Bay Planning Area Boundary |
|  | Land Extensive Agriculture/Scenic Resources Unit (LEA-100-SR) | | |
|  | Land Extensive Agriculture/Scenic Resources (LEA-160-SR) | | |
|  | Land Extensive Agriculture/Scenic Resources Unit (LEA-60-SR) | | |

Note: Because Sonoma County does not have county-wide zoning maps, the BR and SR designations were derived from the County's Open Space Plan Map.

*Boundaries of the diked baylands and wetlands are derived from the San Francisco Estuary Institute EcoAtlas.



(These maps represent generalized views of the zoning for diked baylands and wetlands. To find out the specific zoning of a particular parcel, refer to your city or county's zoning maps.)



4. **Napa County.** Of the 8,340 acres of agricultural lands in unincorporated Napa County within the North Bay planning area, approximately 1,040 acres are diked baylands. Almost all this land is zoned for agricultural use with relatively low residential density parcel sizes.(one dwelling unit per 40-160 acres). Only a small area is zoned for more intense, urban uses. Thirty acres are zoned for airport use, which allows agriculture but no other uses except those related specifically to airport use and 60 acres are zoned for high-density residential and commercial uses along Cuttings Wharf Road on the west bank of the Napa River. This information is summarized in Table 8 and Figure 8 below.

Table 8

Napa County Zoning of Farmed Baylands

Zoning District	Acres	Explanation
RS:FP-1:AC*	30	Residential Single Family
I-AC/GI-AC*	30	Industrial
MC	10	Marine Commercial
AV	30	Airport
AW-FP/AC*	940	Agricultural Watershed: one dwelling unit per 40-160 acres

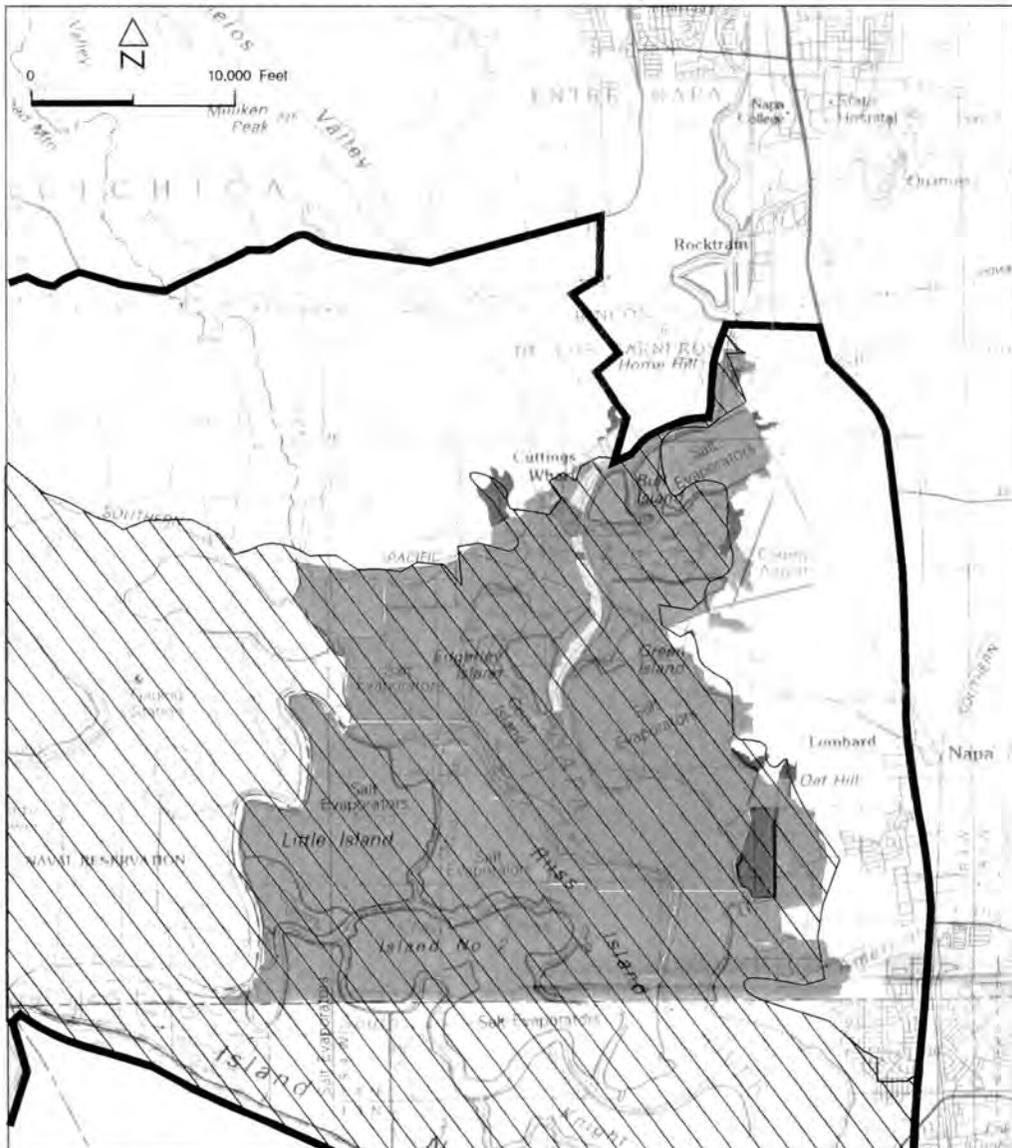
* FP-1: Primary Floodplain Combination; AC: Airport Compatibility.

SOURCE: Adapted from City and County Zoning Maps, General Plans, and the San Francisco Estuary Institute Draft EcoAtlas Map.

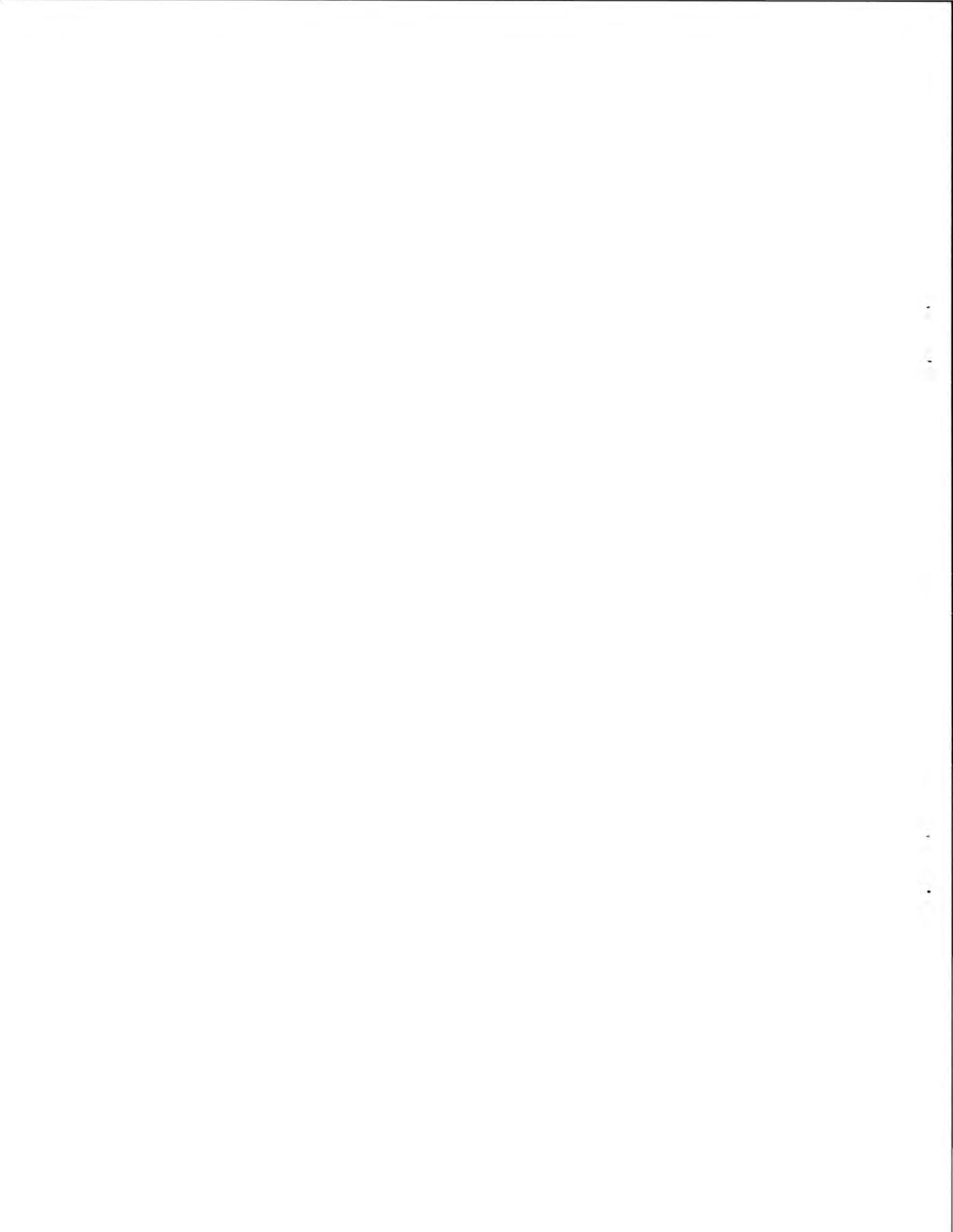
Napa County Zoning for Tidal Areas and Diked Baylands* within the Study Area

- Airport/Airport Compatibility Combination (AV:AC)
 - Agricultural Watershed/Airport Compatibility Combination (AW:AC)
 - Agricultural Watershed/Primary Floodplain Combination (AW:FP-1)
- Agricultural Watershed/Primary Floodplain Combination/Airport Compatibility Combination (AW:FP-1:AC)
 - Marine Commercial (MC:FP-1:AC)
 - Residential Single/Primary Floodplain Combination (RS:FP-1:AC)
 - Historic Margins of Marshlands (Nichols & Wright)
 - North Bay Planning Area Boundary

*Boundaries of the diked baylands and wetlands are derived from the San Francisco Estuary Institute EcoAtlas.



(These maps represent generalized views of the zoning for diked baylands and wetlands. To find out the specific zoning of a particular parcel, refer to your city or county's zoning maps.)



Other Kinds of Local Ordinances

1. **Urban Growth Boundaries.** Several communities in the Bay Area have recently adopted "urban limit lines" or "urban growth boundaries" as a means of containing urban development in a rational and cost effective form and controlling urban sprawl. Urban growth boundaries are effective tools in protecting agricultural⁶⁵. An urban growth boundary sets, often with specified exceptions, the boundary of a city for a specified period of years. Growth of the city is limited to the territory within the urban growth boundary. While protecting open space and agricultural lands outside of the boundary, urban growth boundaries at the same time encourage more cost effective infill development and, often, the revitalization of downtown areas. However, if the city is not the actual provider of urban services such as sewer and water, then the urban growth boundary may not be as effective in controlling development. Urban growth boundaries can be adopted by communities as ordinances through action of the city council or through voter approval on a ballot measure. Novato and Sonoma County both have urban limit lines.

2. **Voter-Initiated Limitation on Agricultural Land Conversion.** Both Napa and Solano County voters have passed initiatives to control urban growth and protect the conversion of agricultural land to urban uses. Measure A, the Slow Growth Initiative, was passed by Napa County voters in 1980 in response to a concern about loss of agricultural land and open space. The Measure required the Board of Supervisors to adopt a Growth Management System Element in the Napa County General Plan. The element includes policies which limit the annual number of new housing units in unincorporated areas through the year 2000⁶⁶, and require at least 15 percent of the annual allowable number of housing permits to be available for average- and below-income housing. Though Measure A was specifically authored for slow growth, its effect is to minimize development pressures on agricultural lands that lie on the urban fringe.

Napa County voters also passed a ballot measure in 1990 to prevent lands from being prematurely or unnecessarily converted to non-agricultural or non-open space uses. Measure J, the Agricultural Lands Preservation Initiative, prohibits the conversion of land designated in the General Plan as "Agriculture, Watershed and Open Space" or "Agricultural Resource" to any other designation until December 31, 2020, unless voters approve the conversion, or unless the Board of Supervisors make six specific findings⁶⁷. Nearly all of the diked baylands in the unincorporated Napa County portion of the planning area fall within one of those two designations.

⁶⁵ The following information on urban limit lines is from an October 8, 1997 news release by the Greenbelt Alliance, from the Fall 1997 issue of Greenbelt Alliance's newsletter Greenbelt Action, and from personal communication with Michael McCauley at the Greenbelt Alliance, San Francisco.

⁶⁶ The limit is based on the population of the nine Bay Area counties, and allows for a maximum annual one percent growth rate.

⁶⁷ These findings have to do with whether the land is likely to be annexed to a city, whether the adjacent properties are developed in a manner comparable to the proposed use, whether adequate public services are available to accommodate the proposed use, whether the proposed use is compatible with agricultural uses, whether the land has

3. Right-to-Farm Ordinances. As residential neighborhoods begin to encroach upon existing farmlands, neighbors disturbed by dust, odors, or noise associated with normal agricultural operations may disrupt the farmers' work. Cities and counties can adopt right-to-farm ordinances in order to protect the rights of farmers to continue their agricultural operations, despite complaints that might arise from neighbors. The ordinances often mandate that notification be sent to all current (and often prospective) property owners, informing them that the normal agricultural operations will not be considered a nuisance. Right-to-farm ordinances have been adopted by all four North Bay counties.

4. Transfer of Development Rights. Transfer of development rights (TDR) programs allow landowners to transfer permitted development densities from one property to another. In this way, the development capability of the "donor" property is reduced by the amount "transferred" and the "receiving" property density, or amount of development, is increased by the amount transferred. Development rights can be bought and sold prior to transfer. Although TDRs have the advantage of providing "donor" landowners with financial gain by the sale of what development rights that may apply to the property under the applicable land use designation and zoning, and the public to gain a public development, such as the preservation of open space or farmland, TDR programs can be administratively complex. Moreover they require an adopted program by the local government that has established both "donor" zoning districts and "receiver" districts. The *Marin Countywide Plan* provides TDR programs; however, the program has only been used in one instance by a property owner in the Nicasio Valley. In that instance the party owned both the receiver and the donor sites.

5. Mitigation Ordinances and Policies. Although wetlands mitigation is a familiar term to many, farmland mitigation is not. However, some cities and counties are beginning to require that when development occurs on farmland, the developer mitigate for the adverse impacts to farmlands. In other words, for every acre of agricultural land a developer converts, he or she must convert another acre into farmland use. The City of Davis adopted such an ordinance in 1995. Other local governments, such as King County in Washington state, have adopted a "no net loss of farmland" policy. These policies can protect local food or forage sources, ensure that a critical mass of farmlands remains, and can increase revenue for farmers.

Local Agency Formation Commissions

The boundary-setting decisions made by county Local Agency Formation Commissions (LAFCOs)⁶⁸ can play a major role in determining the fate of agricultural lands. LAFCOs regulate annexations, incorporation's, the creation of "spheres of influence" and other boundary changes. LAFCO decisions are of particular significance to agricultural interests, since they have substantial

been in agricultural use during the previous two years and whether it is usable for agriculture; additionally, the land proposed for redesignation cannot exceed 40 acres for any one landowner in any calendar year.

⁶⁸ LAFCOs are established by state law in each county, Government Code §56000 et seq.

authority over the conversion of rural and agricultural land into urban development within cities or special districts.

Commentators have opined that in the North Bay, the policies of the Marin and Napa LAFCOs are highly protective of agriculture⁶⁹. Marin LAFCO policies prohibit the annexation of land which is currently in agricultural use or designated as such⁷⁰, to a city or a sanitary sewer agency for the purpose of promoting urban development. Furthermore, Marin LAFCO policies encourage the development of vacant or non-prime agricultural lands for urban uses within a city's or special district's jurisdiction or sphere of influence before it will approve boundary changes that would allow development of existing agricultural or open space lands for non-agricultural or non-open space uses that lie outside of the city's or special district's existing jurisdiction or sphere of influence.

Similarly, Napa LAFCO policies prohibit the inclusion of agricultural lands (as designated by the general plan) within any district or city sphere of influence for purposes of urban development⁷¹. Infill development (of vacant and under-developed lands located within a city's adopted sphere of influence) is encouraged to prevent the premature conversion of agricultural and open space lands.

Sonoma LAFCO follows state policy regarding conversion of agricultural lands. This includes guiding development away from existing prime agricultural lands towards non-prime agricultural lands⁷², and encouraging infill development. Sonoma LAFCO policies also discourage the premature extension of urban services. Development proposals must be consistent with the city or county general plans.

Solano's LAFCO policies are less protective than the other North Bay Counties with regard to the development of agricultural land. Of the six mandatory and five discretionary standards outlined in the Solano County LAFCO Annexation Standards and Procedures (May 1987), "protection of prime agricultural land" is discretionary. Policies encourage, but do not mandate, infill development, and list many conditions under which the conversion of agricultural land in unincorporated areas might be justified, including: owners of infill property are not willing to sell at a fair market rate; the property available in an area is too small to accommodate long-term building objectives of a developer; surrounding older housing reflects a deteriorating environment; and established single-family residential areas object to the higher densities necessary for infill development.

⁶⁹ Handel and Sokolow, Ibid.

⁷⁰ That is, by zoning classification, general plan designation, or Williamson Act contract.

⁷¹ Though some exceptions may be considered.

⁷² "...unless that action would not promote the planned, orderly, efficient development of an area." (Section 56377)

Solano's LAFCO policies also specify that agricultural lands under Williamson Act contracts may be annexed and converted to urban uses if: (1) that land is proposed by the general plan for eventual urbanization and the owner has already filed for non-renewal; (2) the adverse economic effects of the annexation on adjoining agricultural preserves are reasonably mitigated; and/or (3) an agency officially protests the establishment of the contract within its sphere of influence, and is upheld by LAFCO.

State and Federal Land Use Planning and Regulation

Land use planning and control is primarily in the purview of local government in California. However, there is a decided movement toward state, and in certain circumstances federal, involvement in plan use planning and control in specific areas that are of *greater-than-local* concern. In California, these concerns are directed toward protection and management of significant natural resource areas of statewide importance—Lake Tahoe, San Francisco Bay, the coast and the Suisun Marsh.

State Initiated Planning. Perhaps the best example of state initiated planning applicable to the North Bay is the Suisun Marsh Protection Plan and its enabling law, the Suisun Marsh Preservation Act. The *Suisun Marsh Protection Plan*, mandated by the Suisun Marsh Preservation Act of 1974, was developed by the Department of Fish and Game and the San Francisco Bay Conservation and Development Commission with the purpose of protecting the Suisun Marsh in southern Solano County from urban encroachment and to foster improved management of the privately-owned duck clubs in the Marsh. In this model, BCDC established a comprehensive protection plan for the Suisun Marsh. Local governments then adopted local protection programs consistent with the plan. After these programs were certified, the local governments carried out the Protection Plan in the upland agricultural areas surrounding the Marsh while BCDC carried out the plans as adopted by the local governments in the wetland portion of the Marsh.

Under the Suisun Marsh Act, the private duck clubs prepared detailed management plans for these lands specifying where levees were to be constructed and repaired, flooding and drainage ditches to be dug, and other specific land management programs and projects. The individual duck clubs were assisted in this process by the Suisun Resource Conservation District. Once BCDC certified the plans of each club as being consistent with the Suisun Marsh Plan, permits were not required of the land owner for any work carried out consistent with the certified management plan. This process not only provided predictability for land management projects, but streamlined the permit process considerably and led to rather than BCDC, took primary responsibility for all permits for minor developments. The drawback of the Suisun Marsh model is that it does not commit federal agencies, such as the Corps, to the plan; thus applicants must still seek approval from the federal agencies for a project involving work on the duck clubs.

Federally-Recognized Land Use Plans. Special Area Management Plans (SAMPs) is a federally-recognized planning process that establishes a physical land for a resource area, normally wetland areas subject to the Corps' Clean Water Act Section 404 or its Rivers and Harbors Act Section 10 jurisdiction. Once the plan for the area has been approved by the Corps, activities consistent with the plan are granted by the Corps.

In the SAMP model, the U.S. Army Corps creates a "comprehensive plan providing for natural resource protection and reasonable...economic growth containing a detailed and comprehensive statement of policies, standards and criteria to guide public and private uses of lands and waters, and mechanisms for timely implementation" (Federal Register, 1997). The SAMP process is inherently a collaborative one which involves the local land use planning agencies. As part of the SAMP, the Corps generally identifies which areas are considered wetlands (as per the Corps' definition). Thus, because developers know in advance which areas are developable, a good SAMP can provide greater predictability and reduce case-by-case review. One drawback of the SAMP model is that it does not commit the state and local permitting agencies to the plan.

Local governments use special area plans to implement the general plan in specific geographic areas. A specific plan sets forth the distribution, location and extent of land uses and of major components or facilities needed to support those uses. It also specifies the standards and criteria by which development will proceed in the area, as well as standards for the conservation, development and use of natural resources. A specific plan may also address any other subject which a community feels is necessary or desirable to implement the general plan. The Suisun Marsh Protection Plan and the U.S. Army Corps of Engineers' Special Area Management Plans (SAMPs) are two examples of a special area plan that can be used to protect agriculture and wildlife. In a sense, these programs provide a comprehensive plan for wildlife and agricultural protection in the area, while making the permit system predictable and considerably streamlined.

A hybrid version of the SAMP and the Suisun Marsh Protection Plan may be possible, if such a plan is desired by the community. Such a plan would create one vision for local, state, and federal agencies, thus potentially reducing permit timelines and processing requirements for farmers, providing more certainty for farming activities, and enhancing agricultural and wetland protection.

Economic Incentives and Assistance

For farmers to stay in business, farming must be profitable. Moreover, as discussed in Chapter 2 regarding the many values of agriculture to society, there are public benefits associated with agriculture, such as maintaining regional open space and the aesthetic values of agriculture, which, arguably, there should be some compensation to farmers. There are a range of tools available to provide economic assistance to farmers and financial incentives to assist in the continuation of

farming in the North Bay. Economic assistance to farmers is available in the form of tax assistance, cash and tax credits for restricting land to agricultural use, and cash incentives for managing agricultural land for wildlife uses compatible with farming⁷³.

Tax Assistance. Tax assistance for land used for agriculture is available for real estate or property tax relief and additional relief has been made recently through changes to the federal estate tax law.

1. **Williamson Act.** The Williamson Act (The Land Conservation Act of 1965) has played an important role in preserving agricultural land in all four North Bay counties. The Williamson Act gives property owners the option of having their property taxes lowered through an agreement with their county (or city), whereby: (1) the farm owner agrees to restrict the land to agricultural or "related" uses for 10 years, renewing automatically on an annual basis; and (2) the county (or city) agrees to assess the value of the land on its actual agricultural use, rather than on its market value. The market value can be considerably higher than the "use" value, since it often reflects not only the farm income-producing value of the land, but also its residential or commercial development income-producing potential. While the local tax rate does not change under Williamson Act contracts, the property value upon which that tax is based is often substantially lower, resulting in significant savings for the farm owner⁷⁴.

More than 95,000 acres of farmland are currently under Williamson Act contracts in Marin (a small portion of which is in the North Bay planning area, on properties near the Sonoma border); 281,200 acres are enrolled in Sonoma (over 20,000 acres of which are in the North Bay planning area); 67,385 acres in Napa (over 2,000 acres of which are in the North Bay planning area); and over 252,550 acres are under Williamson Act contracts in Solano County (all outside the planning area)⁷⁵. The Williamson Act program has been solid for many years in each of the counties, as demonstrated by very low non-renewal rates.

2. **Remainder Interests.** In a remainder interest situation, the landowner donates or sells full or partial interest in the property, to be transferred after the landowner's death (life estate). In other words, the landowner enjoys all rights to the property during his or her lifetime⁷⁶, and then a remainder of the interest in the property is transferred to the purchasing organization (generally a land trust). Remainder interest donations can provide tax deductions and can lessen the burden of estate taxes.

⁷³ More detailed descriptions of these tools can be found in *Options for Wetland Conservation: A Guide for California Landowners*, available from the California State Coastal Conservancy ((510) 286-1015).

⁷⁴ People for Open Space, 1980a.

⁷⁵ This information is from each of the County Assessors Offices.

⁷⁶ With the exception of uses that degrade natural resource values

3. **Estate Tax and Capital Gains Tax.** As discussed in Chapter IV, in many cases the federal estate tax and capital gains taxes hinder or prevent farm land from being sold to other farmers or passed down from one generation of farmers to another. Moreover, occasionally farm land must be sold to raise the capital to pay estate taxes and capital gains taxes. Although local government in the North Bay cannot effect estate and capital gains taxes, recent changes to the estate tax and the capital gains tax should benefit farmers and ranchers. Please see the discussion concerning taxes in Chapter 4.

Financial Assistance. Financial assistance is available through programs that pay the farmer to keep his or her land in agriculture and to preclude development of the land that would be permitted under existing planning and zoning. These programs purchase certain "rights" to use of the land held by the land owner in the form of conservation easements. Conservation easements can be purchased by anyone or any organization. In the North Bay, conservation easements have been almost universally carried out by nonprofit land trusts. Funding assistance is also available as an incentive for the management of agricultural land to benefit wildlife and a variety of state and federal programs are available as funding sources.

1. **Conservation Easements Land Trusts .** A development right is the right to build on real property. A landowner can sell this right while still retaining title and other rights to use his or her property. Land trusts are organizations that purchase (or receive in donation) development rights on agricultural or undeveloped lands in order to preserve the agricultural or open space uses on those lands⁷⁷. This procedure permits the landowner to receive compensation for keeping the property in agricultural use while ownership of the and all other property rights that run with the land.

The specific restrictions imposed on the type and amount of development on a property, as negotiated between the land trust and the landowner, are set forth in a legal document called a "conservation easement." Conservation easements are recorded on the title to the property, and run with the land in perpetuity. The agricultural or open space uses on a property are therefore protected despite subsequent changes in ownership. The great benefit that landowners gain by selling conservation easements to land trusts is cash upfront, and many agriculturists in the North Bay have taken advantage of that. Landowners who sell conservation easements may also benefit by a substantial reduction in estate taxes. Besides purchasing conservation easements, some land trusts also purchase land, or receive title to land as a donation.

Land trusts exist in all four counties. The benefit that landowners gain by selling conservation easements to land trusts is cash upfront, and many agriculturists in the North Bay have taken advantage of that. Landowners who sell conservation easements may also benefit by a substantial

⁷⁷ Note that open space helps protect agriculture by buffering agricultural lands from conflicting urban uses, and often by blocking the forward creep of urban development.

reduction in federal estate taxes. As discussed earlier in Chapter IV, estate taxes can be so high as to force beneficiaries to sell their inheritance simply in order to pay the taxes on the inherited property. The tax reductions realized through conservation easements can therefore help farm properties to be passed down, intact, to the next generation.

Land trusts occasionally form partnerships with government agencies to purchase conservation easements. Two public funding sources were recently established to help cities, counties, and qualified nonprofit organizations preserve agricultural lands. The Agricultural Land Stewardship Program (ALSP), initiated by the California Department of Conservation in 1996, issues grants to local agencies and nonprofits to acquire agricultural easements⁷⁸. On the federal level, the Farmland Protection Program, created with the enactment of the 1996 Farm Bill and administered by the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS), provides 50 percent matching funds to state and local governments and Indian tribes for purchasing agricultural easements and other interests in land. The Farmland Protection Program is one of four easement acquisition programs administered by the U.S. Department of Agriculture, which also includes the Wetlands Reserve Program (described briefly in the last chapter)⁷⁹.

The Marin Agricultural Land Trust (MALT) is a private, non-profit organization which was founded in 1980 with the primary purpose of preserving agricultural lands. Supported by both private and public funds⁸⁰, MALT purchases agricultural conservation easements, allowing landowners to retain private ownership over the land and to continue realizing its full agricultural potential, but restricting their right to subdivide the land, develop it for non-agricultural residential or commercial uses, or use it in a way that is destructive to the agricultural value and productivity of the land. In exchange, landowners are paid for the "development value" of the land, and may realize a significant reduction in estate taxes. About 25,500 acres are under easement at this time, most of which lies in West Marin. MALT has no easements in eastern Marin (including the diked baylands in the planning area).

The Sonoma Land Trust has been accepting and purchasing undeveloped or agricultural lands and conservation easements since 1975, with its primary goal being the protection of natural habitat. However, the Land Trust also buys agricultural land and leases the land for farming. Most properties have been donated (in exchange for tax advantages), though the Land Trust has also purchased land with grants from outside sources, such as the State Coastal Conservancy or

⁷⁸ The applicant must match at least 5 percent of the value of the grant or receive a donation of at least 10 percent of the easement's value.

⁷⁹ These programs are described in the newsletter, *On Saving Land*, published by The Trust for Public Land (September/October 1997 issue).

⁸⁰ MALT has benefited substantially from Proposition 70, the California Wildlife, Coastal and Park Lands Conservation Bond Act passed by California voters in 1988. The Act provided a \$776 million State bond, \$15 million of which was specifically provided for agricultural land preservation in Marin County. These funds are now nearly depleted, and MALT is working to identify new sources of funds.

Proposition 70 funds. To date, over 10,000 acres of land have been protected in Sonoma County by the Land Trust. Within the North Bay planning area, about 530 acres of agricultural land (in oat hay production) near the Petaluma River are currently under easement. The Land Trust also owns about 830 acres, some of which is in agricultural use, by Highway 37 at Lakeville Highway.

The Napa County Land Trust is dedicated to preserving agricultural and open space lands in the county. The Trust was founded in 1976 and is funded solely by membership dues and donations. The Land Trust does not purchase land or conservation easements but accepts donations of both, in exchange for estate or income tax benefits. Over 10,800 acres of land are currently owned, under easement contracts, or have been acquired and transferred to other agencies by the Trust. In 1979, the Napa County Land Trust transferred White Slough Marsh to the California Department of Fish and Game (CDFG), a 38-acre tidal marsh parcel. Most of the other properties, however, lie outside of the planning area, though activity in the North Bay is increasing. The Trust helped facilitate the recent acquisition of Bull Island by CDFG, a 109-acre parcel adjacent to the Napa River, and is currently soliciting the sale of properties (mostly wetland areas) near the Napa River in the Cameros region.

The Solano County Farmlands and Open Space Foundation is a private, non-profit land trust. The Foundation receives both public and private funds to preserve critical agricultural lands in Solano County, and to preserve open space buffers between cities. Over 4,800 acres are currently owned or under easement contracts by the Foundation, most of which is grazed and some of which is farmed. These lands are, however, outside the North Bay planning area.

2. Management Agreements and Incentive Programs. Under the management agreement technique, a landowner creates an agreement with a government agency or nonprofit to undertake certain habitat improvements and management techniques. In exchange for implementing the agreement, the landowner receives partial financial compensation and technical assistance. Management agreements are especially beneficial for landowners who want to enhance wildlife without making a permanent commitment or selling any property ownership rights.

Many programs can provide funds for management agreements, such as the Environmental Quality Incentives Program (EQIP), the Water Bank Program, the Wetland Reserve Program, Partners for Wildlife, the California Waterfowl Habitat Program, the Wildlife Habitat Incentives Program (WHIP), and the Forest Stewardship Program/Stewardship Incentive Program. Environmental Quality Initiatives Program, or EQIP. EQIP is a cost-share program which provides incentives for farmers to create plans for improving local natural resources. In the North Bay, these plans often focus on agricultural nutrient management, soil erosion, or salmon habitat restoration. The Agricultural Conservation Program, operated by the Foreign Services Agency (FSA), and the National Soil Conservation Service (NSCS), provides cost-share funds for approved practices, such as establishing vegetative cover or installing water control structures. The Water Bank

Program, also operated by the FSA and NSCS, develops 10-year agreements with landowners to manage the land to maintain or improve migratory waterfowl habitats. The Wetland Reserve Program, operated by FSA, NSCS, and USFWS, focuses on purchasing conservation easements on wetlands in agricultural production, or providing cost-share assistance for restoration work. Partners for Wildlife, a U.S. Fish and Wildlife Service (USFWS) Program, offers technical and cost-share assistance to landowners wishing to restore wildlife habitat. The California Waterfowl Habitat Program, administered by the DFG and the California Waterfowl Association, offers landowners \$20 per acre per year to enter into a wetland conservation agreement and manage their wetland property to benefit waterfowl. WHIP makes cost-share funds available to farmers and non-agricultural land owners to improve natural resources (in the case of the North Bay, the resource priority is salmon habitat). The California Department of Forestry and Fire Protection's Forest Stewardship Program/Stewardship Incentive Program, run in conjunction with FSA, provides financial and technical assistance to landowners who want to protect and enhance their forest lands and associated wetlands, through developing a Forest Stewardship Plan. Although each of these programs operate differently, in general, the landowner agrees to improve wetland or riparian habitat and receives a cost-share payment (and, in some cases, technical assistance). Examples of improvements might include revegetating with native plants, creating shallow water areas, fencing riparian areas to exclude livestock, cultivating grain for winter feeding, or other actions⁸¹.

Many of these programs are in use already in the North Bay. For example, in Marin and Sonoma (excluding the Russian River), 26 farmers are enrolled in EQIP, for a total amount of \$375,694. However, the demand for the programs far outstrips the funding and staff available. For example, in 1997, farmers in Marin and Sonoma applied for a total of \$897,331 of funds from the program, but only \$447,000 worth of those applications received funds. The programs lack staff as well as funding. Some North Bay farm service agencies acknowledge that they would like to begin implementing additional programs such as WHIP, but simply lack the staff to do so (Charlotte Sanders, personal communication).

One option to increase agricultural and wetlands protection in the North Bay may be to increase funding and staff for these voluntary management programs. The Permanent Wetland Easement Program might provide a model applicable to the region. This program is similar to those above, protecting marshes through conservation easements and management agreements, but funding is exclusively for selected areas in the Central Valley. It may be possible to develop legislation to provide funding for such a program in the North Bay.

⁸¹ Detailed information about each of these programs can be found in the California State Coastal Conservancy's Options for Wetlands Conservation: A Guide for California Landowners handbook.

3. **Long-Term or Permanent Protection Programs.** Several programs can provide funds for long-term wetland or agricultural protection through acquisitions, conservation easements, and rental agreements. Programs include the Conservation Reserve Program, the Agricultural Land Stewardship Program, the Wetland Reserve Program, the Farmland Protection Program, the U.S. Fish and Wildlife Service Acquisition Program, and the Wildlife Conservation Board Program. The Conservation Reserve Program, operated by FSA, NSCS, and USFWS, provides annual rental payments to farmers who remove highly erodible or environmentally sensitive lands from cropland production for a minimum of ten years. The Agricultural Land Stewardship Program, initiated by the California Department of Conservation, issues grants to local agencies and nonprofits to acquire agricultural easements. The Wetland Reserve Program, operated by FSA, NSCS, and USFWS, focuses on purchasing conservation easements on wetlands in agricultural production, or providing cost-share assistance for restoration work. The Farmland Protection Program, administered by the Natural Resource Conservation Service, provides 50 percent matching funds to state and local governments and Indian tribes for purchasing agricultural easements and other interests in land. The U.S. Fish and Wildlife Service Acquisition Program works with willing sellers to buy land or interests in land with significant wildlife value. The Wildlife Conservation Board Program (operated by WCB and the DFG) acquires interests in land and water for preserving wildlife⁸². In addition, the California Department of Conservation administers a \$3.7 million Agricultural Land Stewardship Program that acquires easements on agriculture land. This program concentrates on the Central Valley, but could be applied to the North Bay.

Other programs protect wetlands and agricultural lands by reducing debt or providing tax breaks, rather than outright payments. The Debt Restructuring Program allows the landowner to reduce his or her debt in exchange for providing permanent conservation easements. Alternatively, the Williamson Act gives property owners the option of having their property taxes lowered through an agreement with their county (or city), whereby: 1) the farm owner agrees to restrict the land to agricultural or "related" uses for 10 years, renewing automatically on an annual basis; and 2) the county (or city) agrees to assess the value of the land on its actual agricultural use, rather than on its market value. The market value can be considerably higher than the "use" value, since it often reflects not only the farm income-producing value of the land, but also its residential or commercial development income-producing potential. While the local tax rate does not change under Williamson Act contracts, the property value upon which that tax is based is often substantially lower, resulting in significant savings for the farm owner⁸³. Over 22,000 acres are in Williamson Act contracts in the North Bay planning area, and non-renewal rates are very low.

⁸² Detailed information about each of these programs can be found in the California State Coastal Conservancy's Options for Wetlands Conservation: A Guide for California Landowners handbook.

⁸³ People for Open Space, 1980a.

Land trusts can also offer long-term or permanent protection for agricultural lands. Land trusts exist in all four North Bay counties. For example, the Napa County Land Trust is dedicated to preserving agricultural and open space lands in the county. The Trust was founded in 1976 and is funded solely by membership dues and donations. The Land Trust does not purchase land or conservation easements but accepts donations of both, in exchange for estate or income tax benefits. Over 10,800 acres of land are currently owned, under easement contracts, or have been acquired and transferred to other agencies by the Trust. In 1979, the Napa County Land Trust transferred White Slough Marsh to the California Department of Fish and Game (DFG), a 38-acre tidal marsh parcel. Most of the other properties, however, lie outside of the planning area, though activity in the North Bay is increasing. The Trust helped facilitate the recent acquisition of Bull Island by DFG, a 109-acre parcel adjacent to the Napa River, and is currently soliciting the sale of properties (mostly wetland areas) near the Napa River in the Carneros region.

Permit Streamlining Programs

According to many farmers, regulations can be a significant obstacle in the farming business. Permit streamlining programs can often lessen the regulatory burden. These programs can create standardized application permits, require joint meetings between permitting agencies, or develop memorandums of agreements that allow property owners more flexibility. Three examples of permit streamlining efforts include the Joint Aquatic Resource Permits Application program in Washington state, the San Francisco Bay Dredged Materials Management Office (DMMO) and the California Department of Fish and Game's (DFG) Streambed Alteration Agreement streamlining effort currently underway in the North Bay.

Joint Aquatic Resource Permits Application (JARPA). The State of Washington's JARPA is a permit application form that consolidates into one application form the forms of seven local, state, and federal agencies. The JARPA simplifies the permit process for applicants who have projects in or near wetlands or aquatic environments by allowing them to complete only one form. However, the JARPA process does not reduce the number of actual permits required. So although the process is an important step in streamlining the permit process, each agency would still review the application as to consistency with the agency's laws and policies.

Dredged Materials Management Office (DMMO). Three state agencies and two federal agencies share the responsibility for managing dredging and disposal of dredged materials in San Francisco Bay. The San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, State Lands Commission, U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency have created the Dredge Material Management Office (DMMO) where applicants can file a single application to be used concurrently by staff from all of the participating agencies in their individual permit processing responsibilities. One of the more attractive features of DMMO is that it encourages the various

staffs to meet jointly to discuss dredging issues, thus providing more consistent answers for permit applicants.

The JARRA process discussed above could be crafted in the North Bay to function much like the DMMO whereby the single application could be discussed by all the permitting agencies with the project applicant so that information could be shared and discussed. Each agency would, however, would continue to issue or deny permits based on the individual agency's laws and policies.

Streambed Alteration Agreement. The California Department of Fish and Game (DFG) has undertaken a pilot program in Napa County to streamline the permitting process for the Streambed Alteration Agreements. Through this process the DFG is working with landowners and the Resource Conservation Districts to develop watershed management plans to protect and enhance certain streams in Napa County. Landowners who are a party to the plan will not need to go through the full streambed alteration agreement process when managing the riparian vegetation along their creeks. Plans for demonstration projects in specific creeks, including Dry Creek and Huichica Creek, are underway.

New Frontiers

Clearly, city and county governments in the North Bay have many tools available to protect agriculture. With this great abundance of tools, which ones should they use?

The answer is complicated by one factor-in the case of the North Bay, these tools should ideally protect both agriculture and wetlands. This criterion may require us to develop new tools, or combine old tools in innovative ways.

In addition to the many tools described above, the following are preliminary suggestions, untested ideas that may have potential in the North Bay. These options would need to be thoroughly explored before they are attempted. Possible new protection techniques could include the following:

- A hybrid special area plan that combines the best features of JARPA, the SAMP and the Suisun Marsh Protection Plan, and commits federal agencies, state agencies, and local governments to a comprehensive vision of wetlands protection and sensitive development in the region, thus providing certainty for developers and streamlined permit processing for farmers.
- A joint powers authority, or a simple joint project, between the four county land trusts, to develop a program that pursues easements and leases in the diked baylands on a voluntary basis with interested landowners. None of the four land trusts currently focus on the agricultural lands in the diked baylands (with the possible exception of the Napa County

Land Trust). Special legislation which allocates conservation easement or management agreements funds to the North Bay could be developed (similar to the Central Valley's Permanent Wetland Easement Program).

- A comprehensive non-regulatory farming program to help make wetlands a profitable crop for farmers. This program could be run by a Resource Conservation District or other pro-farming organization, and could focus on a variety of strategies to help farmers make a buck in the wetlands business, including mitigation banking, incentive programs, environmental tourism, new legislation for a North Bay-specific farming and wetland incentive program, grants for studies of ways to use farming expertise in wetlands mitigation banking, funding to use farmlands as nonstructural flood protection, and funding to hire farmers to maintain levees for their public agency neighbors.
- An agricultural performance zone coupled with a transfer of development rights (TDR) program. In this scenario, a land with little development potential (such as the large lot agricultural zones in Napa and Sonoma) would have an overlay performance zone that awards extra development densities in exchange for permanent wetlands protection and enhancement. In order to decrease the potential impacts of increased development, the performance zone could be coupled with a TDR, so that the extra development credits earned could be transferred to upland locations, if desired. This idea could potentially increase the market value of the land while simultaneously increasing the degree of wetlands protection.
- Increased funding for voluntary agricultural and wetlands protection programs such as EQIP. This funding could either be channeled through existing programs, or a new program directing funding exclusively to the North Bay. Additional funding should also include staff resources for the RCDs, FSA, or other farming agencies implementing the programs.

These strategies should be considered in addition to the traditional tools described in this chapter.

CHAPTER 6

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. Agriculture is the major land use in the North Bay planning area, comprising about 54 percent of the planning area's 174 square miles. Of the nearly 60,000 acres of agricultural land within the planning area, just over 27,000 acres are diked baylands.
 - a. Extensive agriculture is the predominant agricultural activity in the North Bay, comprising 84 percent of all agricultural lands in the planning area (about 50,400 acres). Extensive agriculture consists of non-cultivated grazed range and pasture lands and cultivated lands used to grow forage crops. On diked baylands, practically all agricultural activity in the North Bay planning area is extensive (about 26,795 acres), most of which is in oat hay production.
 - b. Intensive agriculture, which includes primarily vineyards but also scattered farmsteads, dairies, and horse stables, comprises 9 percent (or 9,580 acres) of the North Bay planning area. Very little intensive agricultural activity takes place on diked baylands.
2. Agriculture in the North Bay provides important contributions to the regional economy.
 - a. Agriculture not only benefits the economy through production value, but stimulates additional economic activity in the region through related supplies and service industries, and provides an important source of local jobs.
 - b. There is considerable exchange and interdependence among local farmers, particularly between oat hay farmers and dairy operators. The success of individual farmers depends to a large degree upon the vitality of the agricultural industry as a whole in the North Bay region.
3. Agriculture in the North Bay offers significant benefits for wildlife species, and can help protect and preserve wetland values.
 - a. Many species of birds feed on seeds and insects in agricultural fields. Small and large mammals (such as raccoons and deer), reptiles, and amphibians inhabit the pasture land. Raptors hunt in the fields, and sometimes find rest in perch boxes constructed by farmers. Upland predators use farmed and grazed diked baylands for roosting and nesting, and wetland species depend on these low-lying farmed areas for refuge and food when high tides inundate the normally exposed marshes or mudflats, or during heavy rains.

- b. Research on "key species" in the San Francisco Estuary baylands (species that together can represent the overall complexity of the baylands community and that can serve as indicators of overall bayland health), shows that farmed or grazed diked baylands provide breeding, foraging and resting habitat for only slightly fewer key species than do managed wetlands and therefore the farmed baylands are important habitat.
 - c. Agricultural lands can provide seasonal wetlands, an important ecological function since most of the original seasonal wetlands in the North Bay (which occurred farther inland historically) are now gone. Seasonal wetlands provide feeding habitat for waterfowl, and are breeding grounds for many species of birds and great numbers of amphibians. Small shorebirds use these ponds to rest and feed when high tides cover adjacent mudflats, while larger shorebirds use seasonal wetlands as roosting areas.
 - d. Agricultural lands serve as buffers between urban areas and nearby wetlands, and can act as corridors for wildlife movement in and out of the wetland areas.
 - e. Lands currently in agricultural use that have been diked from the Bay allow for the possibility of future restoration to tidal wetlands or enhancement as seasonal wetlands and related habitat.
4. Agriculture in the North Bay has considerable value in terms of regional open space relief in an urbanized region, and retention of a disappearing regional lifestyle.
5. Agriculturists in the North Bay face several obstacles to remaining in farming. These include: (a) resource constraints (i.e., non optimal soils and a limited supply of suitable water); (b) high land prices; (c) tax burdens (particularly problematic for farmers are capital gains and estate taxes); (d) adjacent uses (such as residential developments, where inhabitants and their pets may disrupt agricultural operations, and adjacent wildlife areas, where, for instance, levee maintenance may become slack); and (e) regulatory/permitting difficulties.
- a. Many farmers in the North Bay view the land use regulatory and permitting process as a significant obstacle to farming. Many concede the need for certain regulations, yet believe the existing regulations to be excessive, confusing, and poorly administered. In particular, North Bay farmers have complained that: the permitting process is overly expensive, time-consuming, and complicated; regulations are at times too rigid; there are too many regulatory agencies and too much duplication of effort; there is a lack of connection between agency officials and farmers; certain regulations may limit the farmer's ability to switch crops; and the over-regulation of properties ultimately robs the value potential of the land.

6. The policies and programs of many public agencies and some nonprofit agriculture and open space land preservation organizations have great impact on agricultural activities in the North Bay, and on its future. These include: (a) general plan policies and zoning ordinances adopted by the City and County governments; (b) Local Agency Formation Commission (LAFCO) policies; (b) land trust purchases and acceptance of conservation easements and agricultural properties; (c) initiatives passed by voters to limit conversion of agricultural and open space land; (d) the Williamson Act; and (e).
 - a. The local government general plans designate most all of the land in the diked historic baylands in agriculture use as planned for either intensive or extensive agriculture use. These land use designations provide a firm foundation for the protection of agriculture in the North Bay. The major exception to this designation is in Sonoma County at Skaggs Island where the former naval facility is designated for public facility use, uses that can be inconsistent with agriculture use.
 - b. The agriculture zoning districts in Sonoma and Napa Counties allow for agricultural uses and minimum lot sizes that provides sufficient protection for continued use for agriculture. The Marin County zoning for agriculture use in the Bel Marin Keys area, Bayfront Conservation/Agriculture allows a minimum parcel size of 10 acres which is inappropriate for the protecting the land, used for oat hay farming, for agriculture use. However the Bayfront Conservation district policies for the area provide a higher level of protection and lead to clustering of residential uses on portions of the area that will have minimum impact on resource and farming values. Novato has zoned land in agriculture use near Black Point for planned community use which is inappropriate for continued agricultural use of the land.

Recommendations

1. Sonoma County should amend its General Plan designating the former naval facility at Island "Land Extensive Agriculture" at a 100 acre minimum parcel size consistent with the designation of adjacent land.
2. To protect agriculture use of existing land near Black Point, Novato should consider adopting a zoning overlay district similar to if not pattered directly after Marin County's Bayfront Conservation District.
3. The Marin Agriculture Land Trust (MALT) should extend its conservation easement acquisition program to eastern Marin County to compliment its western Marin County program. The Sonoma Land Trust should play a more active role in offering to acquire conservation easements on agricultural land in the diked Baylands in Sonoma County. The County Resource

Conservation Districts and the County Farm Bureaus should play an active role in encouraging the extension of the MALT and Sonoma Land Trust programs.

4. A new model of land use planning and regulation should be created for the benefit of agriculture in the diked Baylands in the North Bay. The process should provide certainty to farmers that they can remain farming and minimize regulatory review of normal agriculture land management. The following two models should be evaluated:
 - a. Legislation at the state and federal level should be sought to create a planning and regulatory process for the North Bay diked wetland area and adjacent uplands patterned after the Suisun Marsh Protection Plan model. The planning should authorize the development of management programs for agriculture lands and uses in the planning area and the certification of the programs by a designated representative governmental agency. Permits should not be required for activities consistent with the certified management programs.
 - b. Initiation of a Special Area Management Plan planning process should be created for the diked Baylands in the North Bay that would provide for the predictability in obtaining permits for agricultural uses from federal agencies based on land uses consistent with local government land use and planning.

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APPENDIX A

VOLUNTARY PRACTICES FOR ATTRACTING WILDLIFE TO THE FARM

Many farmers enjoy seeing wildlife on their farms, and some engage in farming practices to actively encourage more wildlife onto their fields. Many of these practices require very little cost, time, or modification of normal farming operations, while others may require more effort or economic investment. The rewards, however, include not only the benefits to wildlife and the satisfaction of seeing more wildlife, but sometimes significant financial savings or earnings. For example, some practices may help reduce problems with flooding, soil erosion, water quality, groundwater recharge, or noxious weeds; while other practices may augment the farmer's income through, for instance, shelterbelt fuel wood sales or recreational opportunities, such as hunting or wildlife viewing.

The booklet *Farming for Wildlife: Voluntary Practices for Attracting Wildlife to Your Farm*, written by Jeanne Clark and Glenn Rollins (California Department of Fish and Game), describes 20 "wildlife-friendly" farming practices which agriculturalists can do to attract wildlife to their fields. All of these practices are voluntary. The booklet also lists organizations which can assist with information, technical help, cost-sharing, grants, and other money arrangements.

Below is a brief example of some of the "wildlife-friendly" practices presented by Clark and Rollins. However, farmers who are seriously interested should obtain the booklet for more detailed information.

Delay the harvest. Delay the grain and hay harvest, if possible, to avoid killing or displacing nesting pheasants and ducks, or destroying their nests. While early cuttings are necessary for most haying operations, the booklet points out that a delay of a few weeks or even days in some locations can significantly increase duck and pheasant production.

Change harvesting pattern or reduce harvesting speed. Harvesting in strips (rather than in circles), and slowing the harvesting speed where nesting activity has been observed, allows setting ducks and pheasants to flush away from harvesting equipment. Some farmers also mount simple scare devices (flush bars) on the front of their tractors to frighten the birds off their nests. Also, some farmers in the Central Valley have received "egg salvage" permits from the U.S. Fish and Wildlife Service, which allows them to collect and incubate the abandoned eggs, and eventually to release the offspring.

Leave some of the crop unharvested. Leaving small portions of the crop unharvested in thin strips, scattered patches, at field corners, or along dikes provides food and cover for wildlife. The

authors note that this practice may be far less costly than expected. For example, one grain farmer was surprised to learn that leaving 0.1 acre of wheat standing cost him only \$35 in profits for that year.

Plant cover crops between rows. Grape growers can provide excellent nesting, food, and escape cover for many wildlife species (including beneficial insects) by planting permanent or temporary cover crops between rows. The cover crops may also stabilize the soil, reduce soil erosion and soil compaction, provide green manure, increase water filtration, control noxious weeds (reducing the need for herbicides), and lower labor costs by requiring less discing.

Consider using Integrated Pest Management (IPM) techniques. IPM programs are customized for individual farms, and may include: encouraging biological control; choosing resistant varieties or certified seed; using oils, pheromones, or selective chemicals; planting permanent borders and cover crops; adopting alternative cultivating, pruning, or fertilizing practices; rotating crops; modifying tillage and sanitation practices; choosing planting and harvesting times to avoid major pests; and modifying the habitat to make it less compatible with pest development. IPM reduces the use of fertilizers, insecticides, and herbicides, which may benefit the farmer in terms of equipment and labor expense savings, as well as encourage wildlife populations (by reducing their exposure to these chemicals, and by providing or enhancing beneficial habitat).

Plant perennial vegetation in areas that can stay undisturbed. Planting perennial grasses, shrubs, trees, and other plants in areas that can remain undisturbed (such as road borders, fencerows, equipment yards, field borders, uncultivated uplands, levees and ditch banks) can attract many species of wildlife. It also has the added benefits of: eliminating the need for repetitive discing, scraping, and burning to keep those unused areas clean; reducing erosion or dust; potentially reducing the need for pesticides by encouraging beneficial insects and insect-eating birds; increasing water infiltration; potentially improving water quality by filtering out contaminants before the water enters irrigation ditches; and potentially offering income opportunities for hunting or wildlife viewing.

Install artificial nesting or roosting structures. Artificial structures are available for many types of birds of prey, song birds, and bats. The Audubon Society or California Waterfowl Association can provide nest box plans and advice.

Plant perennial vegetation on ditch slopes or clean only one side of ditch each year. Planting perennial vegetation provides good wildlife habitat near water, can eliminate noxious weeds, and can reduce ditch maintenance costs. Where it is not feasible to plant self-sustaining perennial vegetation (e.g., where siltation is a problem), then cleaning only one side of the ditch or

levee slope each year would still leave vegetation on the other side to provide habitat. These practices also help stabilize banks and reduce soil erosion.

Establish vegetation adjacent to sloughs, streams, and ponds. Riparian areas support more wildlife species than any other type of habitat. Leaving or planting vegetation adjacent to aquatic systems also stabilizes banks, reduces soil erosion, and protects adjacent fields from desiccating winds and dust.

Leave some ditches and sloughs flooded year-round. Leaving some waterways flooded not only provides a stable source of drinking water for wildlife, but also provides riparian and aquatic habitat, aids in groundwater recharge with some soils, and offers stored water sources for firefighting.

APPENDIX B

METHODOLOGY

The North Bay Wetlands and Agriculture Protection Program applies an innovative on-line Geographic Information System (GIS), called GRASSLinks¹, as a land use planning tool to map and analyze the regional distribution of land use data. GRASSLinks, developed by Dr. Susan Huse, allows the public to remotely access the University of California at Berkeley's GIS facilities. The database includes maps of environmental and political interest for the San Francisco Bay and Delta region. BCDC contracted with the Regional Environmental Geographic Information Systems (REGIS) via the Center for Environmental Design and Research (CEDR) to help prepare land use and natural resource maps and place them on GRASSLinks.

GRASSLinks and the data created for the North Bay can be accessed by connecting to the Internet and typing <http://www.regis.berkeley.edu/grasslinks>.

Geographic Information Systems are a combination of spatial data, hardware, and software that allow for complex spatial analysis and querying of mapped information. The capabilities of GIS include inventorying a specific geographic variable, such as existing land uses, querying for the existence of items of interest, measuring the extent of various features, analyzing the coincidence of multiple factors, and monitoring changes over time. Common applications include natural resource management, environmental assessment, and land use planning². REGIS and GRASSLinks use a public domain software called Geographic Resources Analysis Support System (GRASS), developed by the U.S. Army Corps of Engineers.

To electronically map the distribution of existing land uses, local government general plan designations, and major public ownership in the North Bay planning area, CEDR staff used the Geographic Information System at REGIS and GRASS GIS software. GRASS is an interactive tool for the management, analysis and display of geographically referenced data. GRASS software includes capabilities for digitizing maps, importing existing vector (line) and raster (grid-based) data and performing statistical analysis.

On the basis of the revised hard-copy maps, and using GRASS, CEDR staff electronically edited and updated the 1985 Land Use map to create the 1995 Existing North Bay Land Use map for the North Bay planning area. To analyze the existing agricultural uses in the North Bay, BCDC staff aggregated the following land use categories into intensive and extensive agricultural uses, as follows:

¹ A purpose of GRASSLinks is to provide a prototype for cooperation and data sharing between environmental planning agencies, public interest groups, citizens and private entities.

² San Francisco Estuary Project, 1992.

1. The Extensive Agriculture classification includes:

Category 21-Cropland and Pasture. Included in this category are harvested, idle, and cultivated cropland, as well as pasture.

Category 31-Herbaceous Rangeland. This division of land use includes areas where the natural vegetation is largely grasses and grass-like plants, shrub and brush, and chaparral.

Category 33-Mixed Rangeland.

2. The Intensive Agriculture classification includes:

Category 22-Orchards, Groves, Vineyards, Nurseries and Ornamental Horticulture Areas. This land produces most of the various nut and fruit crops. Horticulture areas include greenhouses, floriculture areas, and sod farms used year after year for these purposes.

Category 23-Confined Feeding. Included in this category are large poultry farms, as well as hog and cattle feedlots. The use is characterized by large animal populations in confined areas with many associated buildings, fences, and waste disposal areas.

Category 24-Farmsteads and Other Agriculture. The largest component of this land use is inactive farmland. For the purposes of this project, the main facilities, or "headquarters," of the ranches and farms have been included in this category.

The agricultural lands which fall within the Nichols and Wright line were analyzed as "diked agricultural baylands". This line was generated from the Nichols and Wright report of 1971, which mapped the former extent of San Francisco Bay marshlands. For a map of the historic wetlands and uplands in the North Bay planning area as delineated by the Nichols and Wright line, please see the BCDC staff background reports, North Bay Land Use and Public Ownership (January 1997, p. 15) or Wetlands in the North Bay Planning Area (February 1997, p. 9).