

## Butte County Baseline Food Assessment

### List of Appendices

Appendix A: Assessment and Core Planning Teams, Information and Interview Contacts

Appendix B: Map of Butte County

Appendix C: Calculations Used in the Baseline Food Assessment

Appendix D: List of Water Districts

Appendix E: Butte County Agricultural Water Use Data

Appendix F: Map of Important Farmland

Appendix G: Land Use Conversion Graphs

Appendix H: Butte County Land Use Summary

Appendix I: Acreage and Proportionate Extent of Soils

Appendix J: Fire Damage by Soil Type

Appendix K: Regenerative Agriculture

Appendix L: Agriculture Sector Growth and Earnings

Appendix M: Food Policy and Regulations

Appendix N: Perspectives from Local producers

Appendix O: Environmental Challenges and Resources

Appendix P: List of Local Agrarian Networks and Resources

Appendix Q: Farmers Markets in Butte County

Appendix R: Disadvantaged Communities

Appendix S: Food Disaster Preparedness

Appendix T: Food Pantries and Free Meals Serving Butte County

## Appendix A

### Butte County Food Assessment Team

Project Lead: Pamm Larry

Team Coordinator: Maria Giovanni

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### Core Planning Team

Dede Duong, Butte County Office of Education

Jennifer K Dye, Center for Healthy Communities, Chico State Enterprises

Maria Giovanni, Chico State University

Kim Haas, Butte County Environmental Health

Patrizia Hironimus, Office of Debra Lucero, Butte County District 2 Supervisor

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Joleen Levey, Adventist Health Feather River Health Foundation

Debra Lucero, Butte County District 2 Supervisor

Jona Pressman, University of California Cooperative Extension, Butte County

Julianna Roberts, Butte County Office of Education

Leslie Roberts, Butte County Environmental Health

Jennifer Veilleaux, Butte County Environmental Health

Ashley Wais, Butte County Public Health

### Information/Interview Contacts

Amaro	Irma	Four Winds Indian Ed, Director
Brown	Alex	Chico City council
Byrne	Candace	Edible Shasta Butte
Carle	Lisa	Pyramid Farms
Chavez	Christina	Live Spot Oroville
Dufour	Kim	North Valley Community Foundation
Erickson	Emilia	Resident of Concow
Espino	Luis	UC Cooperative Extension
Grist	Scott	CSUC Organic Vegetable Project
Haney	Joey	Chico Natural Foods
Hejl	Joe	Boys & Girls Club North Valley

Irvine	Chelsea	3Core (formerly)
Jackson	Katie	Orchard Hospital
Johansson	Nicole	Sierra Oro Farm Trail
LaRocca	Phaedra	LaRocca Vineyards
Leveroni	Amanda	Restaurateur
Lowrey	Jenny	From The Ground UP
Lukes	Laura	Master Gardener/Journalist
Malugani	Spencer	CHC CalFresh Outreach
Mash	Guillermo	Without A Roof
Meza	Valerie	Butte County
Neilsen	Ben	Lassen Traditional Cidery
Parker	Caitlyn	BC WIC
Peterson	Jennifer	Paradise Guilds/Paradise Seed Lending Library
Pittman	Eric	Butte County Deputy Agricultural Commissioner
Rider	Tom	CSUC Dining Services Director
Roth	Richard	Resident of Chico
Shadley	Anjanette	Western Canal Water District
Sorenson	Janeva	Camp Fire Restoration Project
Stupnagel	Frannie	GRUB CSA
Sullivan	Tim	Farm Star Pizza
Sydenstricker	Phil	Enloe Hospital
Tuvell	Priya	CSUC Reg Ag
Univ Calif	Coop Exten	UCCE
Yale	Richard	St. John's Episcopal Church
Yutzy	Donna	Magalia Community Park

Appendix B Map of Butte County



## Appendix C

### Calculations Used in the Baseline Food Assessment

1. Capacity to feed ourselves: Census data was used to determine the number of adults and youth (under 18 years) in Butte County. USDA recommendations by food group were used to determine nutritional needs of each Butte County resident according to their age. Crop Reports, published by the Agriculture Commissioner, were used to determine the yields of common agricultural products. Yields of these products were compared to resident dietary needs. For milk, gallons of milk production was compared to gallons of milk needed to meet the dietary recommendations for each resident for one year. For grain, production of wheat was converted to its equivalency in loaves of bread using the following conversions:
    - One bushel of wheat weighs approximately 60 pounds (2000 lbs in ton)
    - One bushel of wheat yields approximately 42 pounds of white flour.
    - One bushel of wheat yields approximately 60 pounds of whole-wheat flour.
    - A bushel of wheat yields 42 commercial loaves of white bread (one-and-a-half pound loaves).
    - A bushel of wheat makes about 90 one-pound loaves of whole wheat bread.
    - There are approximately 16 ounces of flour in a one-and-a-half pound loaf of bread.

For rice, production was divided into ounce equivalents and then compared to daily recommendations of 6 oz per resident. Number of cattle heads was converted to an edible portion using an estimated yield of 40%. This was converted into 4 oz equivalents and translated into number of hamburgers per resident. Because not all vegetable production yields are reported in the county Crop Reports, estimates were calculated based on acreage and on moderate yields. As a reference, green beans produce 10,000 lbs per acre, broccoli and carrots about 18,000 lbs per acre, cabbage 40,000 lbs per acre, and beets 50,000 lbs per acre. Using a moderate yield between 20,000 - 25,000 lbs per acre, production of vegetables was estimated in lbs, converted to cups using the reference weight of broccoli, a medium-weighted vegetable, and then compared to daily vegetable recommendations per resident. Alternatively, vegetable production yields per acre were provided by local producer Pyramid Farms and extrapolated to determine the number of acres required to meet daily vegetable recommendations.
2. Local Direct to Consumer Sales: Census of Agriculture (2017) values for direct-to-consumer sales and sales for regionally branded products were divided by total market value of sales in order to get an estimate for the percentage of food grown here that is sold here.
  3. Sales of Locally Produced Foods: Household food expenditure was estimated based on state-level data on consumer spending obtained from the U.S. Bureau of Labor Statistics. This was compared to sales of local foods per Census of Agriculture (2017) to determine the amount of household food expenditure that is spent on locally produced foods.

## **Appendix D: List of Water Districts**

### Water Districts in Butte County

1. Western Canal Water
2. District Richvale Irrigation District
3. Ramirez Water District
4. Durham Mutual Water Company
5. Butte Water District
6. Biggs West Gridley Water District
7. South Feather Water & Power Agency
8. Thermalito Water & Sewer District
9. Calwater Chico
10. Calwater Oroville
11. Del Oro Water Company
12. Durham Irrigation District
13. Gran Mutual Water Company
14. Lake Madrone Water District
15. Paradise Irrigation District

Appendix E. Butte County Agricultural Water Use Data: 2011-2015 crop acreages and seasonal total water use and demand estimates. For 20 crop categories by combinations of detailed analysis unit and county (DAU/County) over California are developed by CA Department of Water Resources (DWR) Region Offices (Northern Region Office, North Central Region Office, South Central Region Office, and Southern Region Office) using CalSIMETAW for updating the information in the California Water Plan 2018.

Crop	ETc	Ep	Ep	Etaw	Etaw	AW	AW	CF
	acre-ft	acre-ft/acre	acre-ft	acre-ft/acre	acre-ft	acre-ft/acre	acre-ft	%
Grain	6603.19	0.51	1916.84	1.25	4660.52	1.42	5294.96	0.88
Rice	256338.6	0.02	1702.81	2.75	245096	2.96	263294.7	0.93
Cotton	0	0	0	0	0	0	0	0
Sugar Beets	96.06	0.28	7.93	3.08	88.06	3.75	107.21	0.82
Corn	421.36	0.07	12.5	2.12	406.76	2.49	478.67	0.85
Dry Beans	718.62	0.08	30.09	1.87	686.39	2.21	809.09	0.85
Safflower	385.1	0	0	1.89	390.61	2.22	459.15	0.85
Other Field Crops	726.66	0.07	20.97	2.4	718.92	2.73	816.88	0.88
Alfalfa	4436.15	0.27	315.22	3.54	4093.07	4.22	4869.6	0.84
Pasture	37769.32	0.48	4235.26	3.74	33316.63	4.5	40138.45	0.83
Tomato Processing	2548.48	0.09	82.43	2.63	2462.99	3.1	2902.35	0.85
Tomato Fresh	0	0	0	0	0	0	0	0
Cucurbits	449.32	0.02	5.11	1.78	454.63	1.88	479.29	0.95
Onions & Garlic	356.84	0.47	47.94	3.04	307.93	3.5	354.67	0.87
Potatoes	0	0	0	0	0	0	0	0
Truck Crops	2150.77	0.11	86.59	2.66	2082.09	2.89	2264.95	0.92
Almonds & Pistachios	154902.65	0.14	5245.65	4	148616.5	4.21	156430.9	0.95
Other Deciduous	203608.31	0.2	11730.01	3.19	190282.5	3.36	200418.3	0.95
Citrus & Subtropical	13133.46	0.54	2215.14	2.64	10831.24	2.81	11525.79	0.94
Vineyard	683.14	0.39	101.37	2.23	578.11	2.34	608.6	0.95
Total	685328.02	0.13	27755.86	3.11	645072.9	3.34	691253.5	0.93

Citation for Appendix: "Agricultural land and water use estimates," accessed 1.31.22, <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Agricultural-Land-And-Water-Use-Estimates>

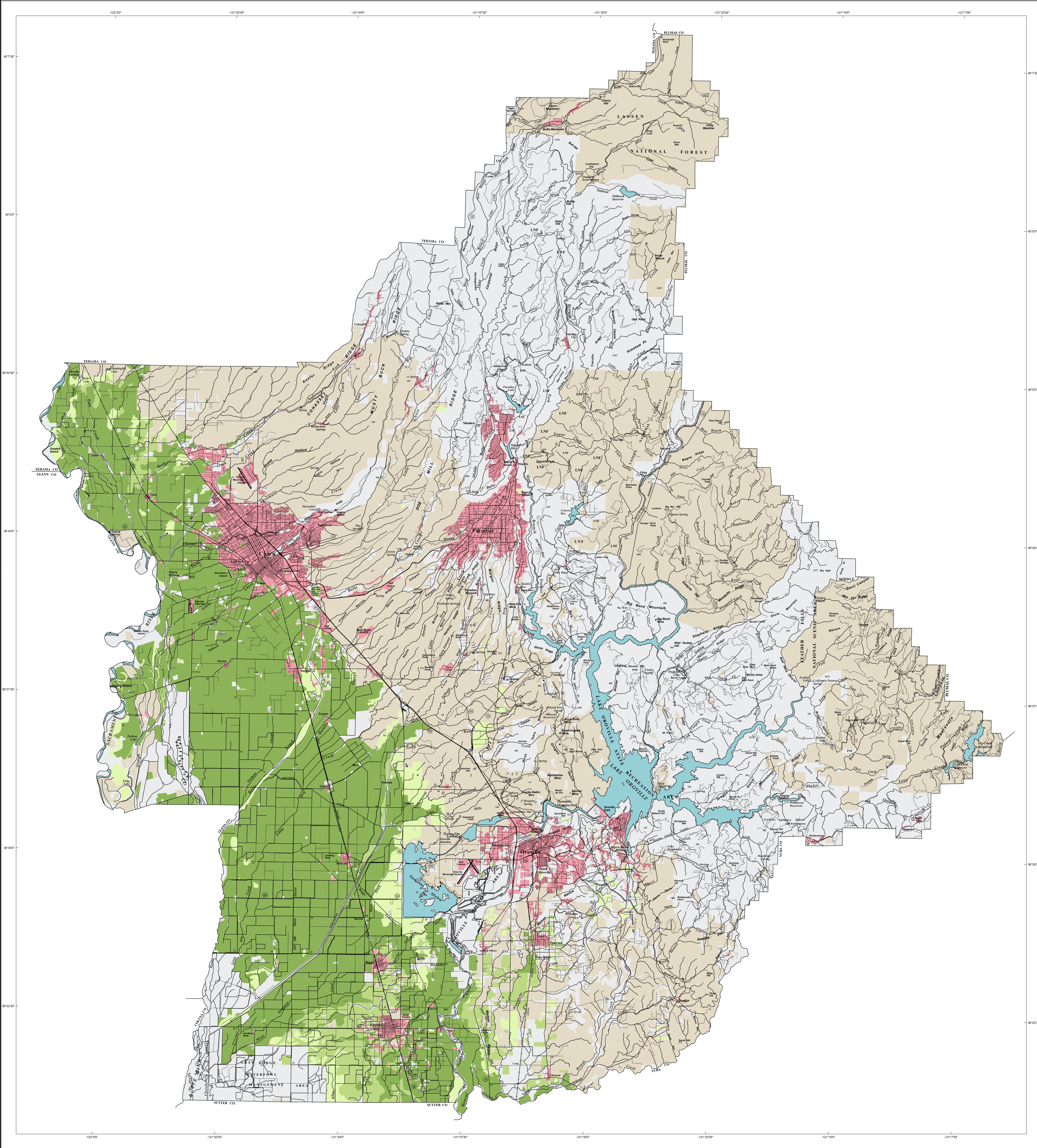
Annual estimates of:

- ETc, Crop Evapotranspiration: the quantity (depth) of water transpired by plants, retained in plant tissue, and evaporated from adjacent soil surfaces during a specific time
- Ep, Effective precipitation: the portion of precipitation that supplies crop evapotranspiration, ETc, including precipitation stored in the soil before and during the growing season
- ETaw, Evapotranspiration of Applied Water: the amount of applied water beneficially transpired by plants, retained in plant tissue, and evaporated from adjacent soil surfaces during a specific time
- AW, Applied Water: the quantity of water applied to a specific crop per unit area
- CF, Consumed Fraction: percentage of the total amount of water applied by irrigation that is retained within the root zone and is available for crop ET.

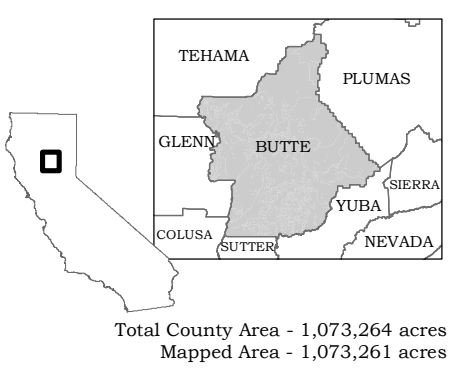
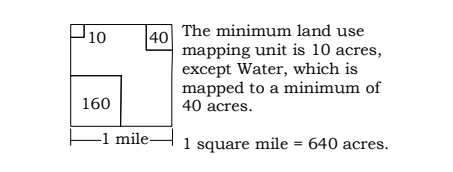
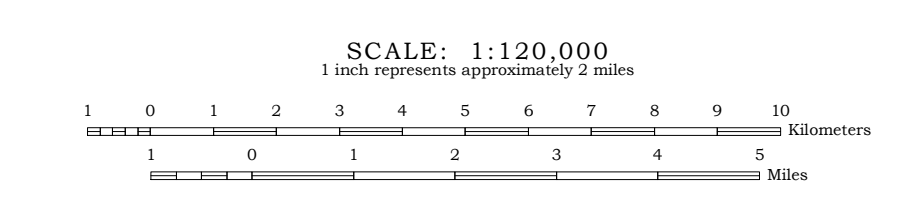




# BUTTE COUNTY IMPORTANT FARMLAND 2018



- PRIME FARMLAND**  
PRIME FARMLAND HAS THE BEST COMBINATION OF PHYSICAL AND CHEMICAL FEATURES ABLE TO SUSTAIN LONG-TERM AGRICULTURAL PRODUCTION. THIS LAND HAS THE SOIL QUALITY, GROWING SEASON, AND MOISTURE SUPPLY NEEDED TO PRODUCE SUSTAINABLE HIGH YIELDS. LAND MUST HAVE BEEN USED FOR IRRIGATED AGRICULTURAL PRODUCTION AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.
- FARMLAND OF STATEWIDE IMPORTANCE**  
FARMLAND OF STATEWIDE IMPORTANCE IS SIMILAR TO PRIME FARMLAND BUT WITH MINOR SHORTCOMINGS, SUCH AS GREATER SLOPES OR LESS ABILITY TO STORE SOIL MOISTURE. LAND MUST HAVE BEEN USED FOR IRRIGATED AGRICULTURAL PRODUCTION AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.
- UNIQUE FARMLAND**  
UNIQUE FARMLAND CONSISTS OF LESSER QUALITY SOILS USED FOR THE PRODUCTION OF THE STATE'S LEADING AGRICULTURAL CROPS. THIS LAND IS USUALLY IRRIGATED, BUT MAY INCLUDE NONIRRIGATED ORCHARDS OR VINEYARDS AS FOUND IN SOME CLIMATIC ZONES IN CALIFORNIA. LAND MUST HAVE BEEN CROPPED AT SOME TIME DURING THE FOUR YEARS PRIOR TO THE MAPPING DATE.
- GRAZING LAND**  
GRAZING LAND IS LAND ON WHICH THE EXISTING VEGETATION IS SUITED TO THE GRAZING OF LIVESTOCK.
- URBAN AND BUILT-UP LAND**  
URBAN AND BUILT-UP LAND IS OCCUPIED BY STRUCTURES WITH A BUILDING DENSITY OF AT LEAST 1 UNIT TO 1.5 ACRES, OR APPROXIMATELY 6 STRUCTURES TO A 10-ACRE PARCEL. COMMON EXAMPLES INCLUDE RESIDENTIAL, INDUSTRIAL, COMMERCIAL, INSTITUTIONAL FACILITIES, CEMETERIES, AIRPORTS, GOLF COURSES, SANITARY LANDFILLS, SEWAGE TREATMENT, AND WATER CONTROL STRUCTURES.
- OTHER LAND**  
OTHER LAND IS LAND NOT INCLUDED IN ANY OTHER MAPPING CATEGORY. COMMON EXAMPLES INCLUDE LOW DENSITY RURAL DEVELOPMENTS, BRUSH, TIMBER, WETLAND, AND RIPARIAN AREAS NOT SUITABLE FOR LIVESTOCK GRAZING, CONFINED LIVESTOCK, POULTRY, OR AQUACULTURE FACILITIES, STRIP MINES, BORROW PITS, AND WATER BODIES SMALLER THAN 40 ACRES. VACANT AND NONAGRICULTURAL LAND SURROUNDED ON ALL SIDES BY URBAN DEVELOPMENT AND GREATER THAN 40 ACRES IS MAPPED AS OTHER LAND.
- WATER**  
PERENNIAL WATER BODIES WITH AN EXTENT OF AT LEAST 40 ACRES.



**Important Farmland Maps** are compiled by the Farmland Mapping and Monitoring Program (FMMP) pursuant to Section 65570 of the California Government Code. To create the maps, FMMP combines current land use information with U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS) soil survey data. Soil units qualifying for Prime Farmland and Farmland of Statewide Importance are determined by the NRCS. Changes to soil profiles subsequent to publication of NRCS Gridded Soil Survey Geographic (gSSURGO) Database for California, September 25, 2018 are not reflected on this map. This map was developed using NRCS gridded digital soil data (gSSURGO) and may contain individual soil units less than one acre.

Land use status is determined using current and historic aerial imagery, supplemental GIS data, and field verification. Imagery sources may include public domain datasets, web-based information, and commercially purchased data. Depending on data availability, supplemental data on land management status is obtained from federal, state, and local governments. Map reviewers at the local level contribute valuable information with their comments and suggestions.

County boundaries for the 2018 Important Farmland Series are from the California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP) 2018 version of California Counties GIS data.

Cultural base information for the Important Farmland Maps was derived from public domain data sets, based upon design of the U.S. Geological Survey, with updates generated by digitizing over current imagery.

**This map should be used within the limits of its purpose** - as a current inventory of agricultural land resources. This map does not necessarily reflect general plan or zoning designations, city limit lines, changing economic or market conditions, or other factors which may be taken into consideration when land use policies are determined. This map is not designed for parcel-specific planning purposes due to its scale and the ten-acre minimum land use mapping unit. Classification of important farmland and urban areas on this map is based on best available data. The information has been delineated as accurately as possible at 1:24,000-scale, but no claim to meet 1:24,000 National Map Accuracy Standards is made due to variations in the quality of source data.

The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose.

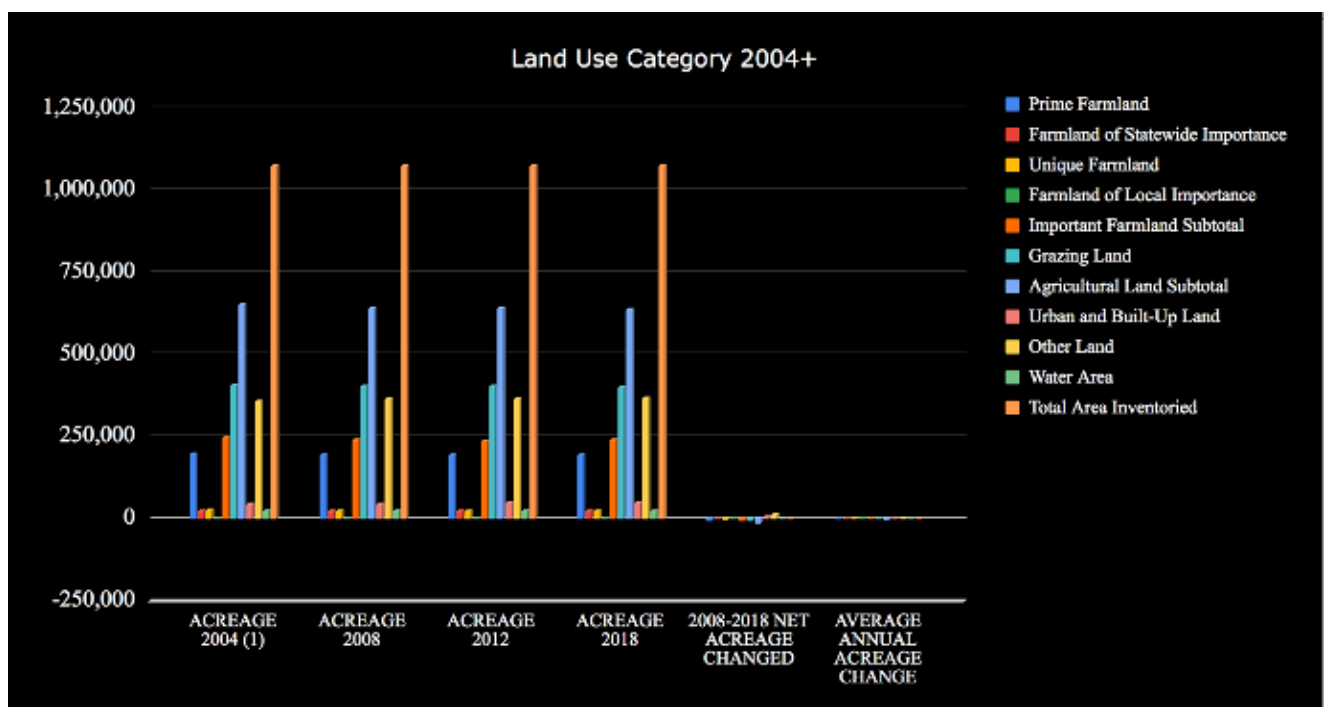
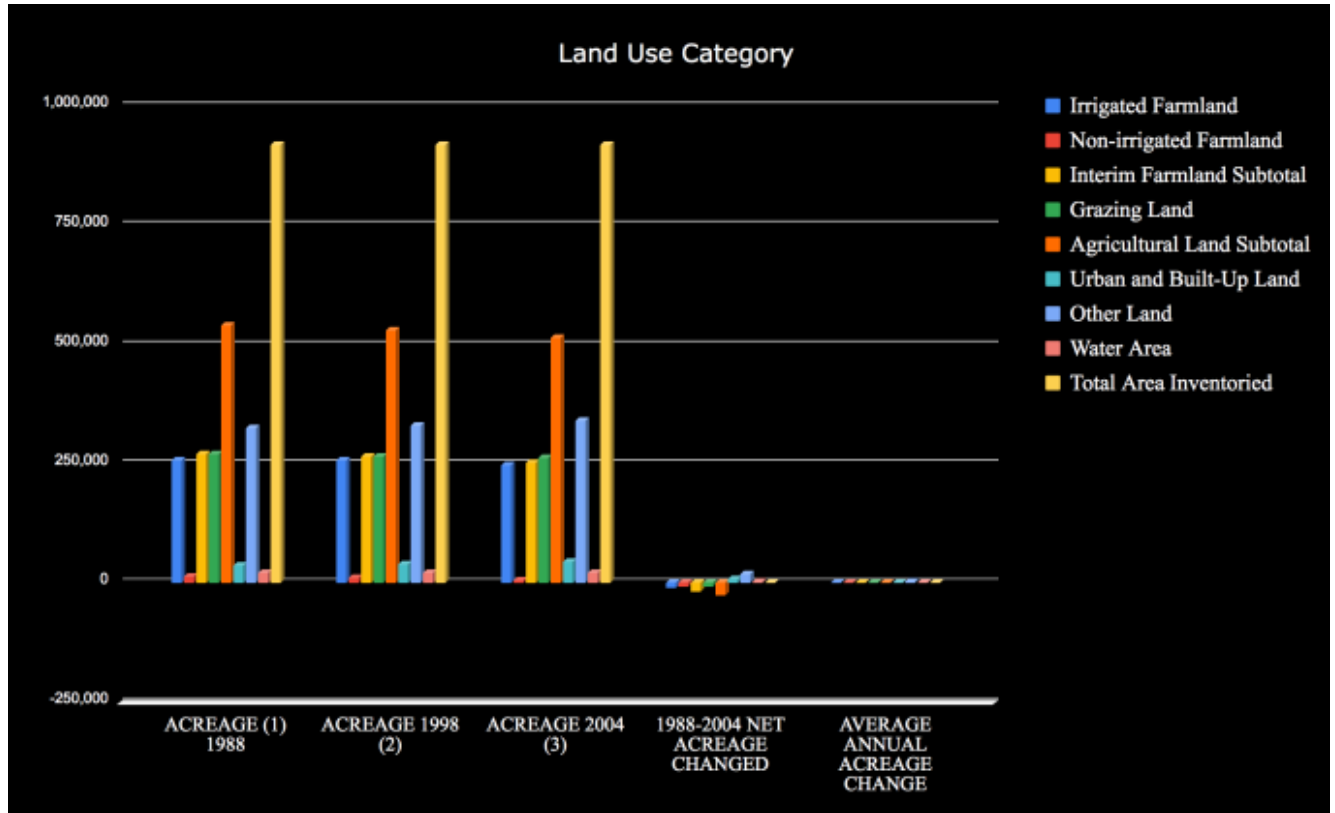
**Additional data is available** at [www.conservation.ca.gov/dlrp/fmmp](http://www.conservation.ca.gov/dlrp/fmmp), including detail on the program, statistics, and GIS data for download. Contact the:

Farmland Mapping and Monitoring Program  
801 K Street, MS 14-15  
Sacramento, CA 95814  
Phone: 916.324.0850  
e-mail: [fmmp@conservation.ca.gov](mailto:fmmp@conservation.ca.gov)

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Map published March 2021.



Appendix G. Butte County Land Use Categories and Conversion for 1988-2004 (top) and 2004-2018 (bottom) (Source: California Department of Conservation<sup>1</sup>)



<sup>1</sup> <https://www.conservation.ca.gov/dlrp/fmmp/Pages/Butte.aspx>

Appendix H.

**BUTTE COUNTY**  
**2004-2018 Land Use Summary**  
 Farmland Mapping and Monitoring Program  
 CALIFORNIA DEPARTMENT OF CONSERVATION

LAND USE CATEGORY	ACREAGE 2004 <sup>(1)</sup>	ACREAGE 2006 <sup>(2)</sup>	ACREAGE 2008	ACREAGE 2010	ACREAGE 2012	ACREAGE 2014	ACREAGE 2016 <sup>(3)</sup>	ACREAGE 2018	2008-2018 NET ACREAGE CHANGED	AVERAGE ANNUAL ACREAGE CHANGE
Prime Farmland	197,557	196,217	194,689	193,289	192,643	192,293	192,561	192,713	-4,844	-346
Farmland of Statewide Importance	22,323	21,602	22,794	21,872	21,699	21,575	21,598	22,397	74	5
Unique Farmland	24,957	24,236	23,078	22,189	22,044	22,430	23,279	23,761	-1,196	-85
Farmland of Local Importance	0	0	0	0	0	0	0	0	0	0
<b>Important Farmland Subtotal</b>	<b>244,837</b>	<b>242,055</b>	<b>240,561</b>	<b>237,350</b>	<b>236,386</b>	<b>236,298</b>	<b>237,438</b>	<b>238,871</b>	<b>-5,966</b>	<b>-426</b>
Grazing Land	406,401	407,680	401,859	402,999	403,741	401,751	400,165	398,764	-7,637	-546
<b>Agricultural Land Subtotal</b>	<b>651,238</b>	<b>649,735</b>	<b>642,420</b>	<b>640,349</b>	<b>640,127</b>	<b>638,049</b>	<b>637,603</b>	<b>637,635</b>	<b>-13,603</b>	<b>-972</b>
Urban and Built-Up Land	43,820	44,804	45,350	45,913	46,030	46,329	46,647	46,650	2,830	202
Other Land	355,572	355,895	362,624	364,131	364,219	366,013	365,964	365,781	10,209	729
Water Area	22,624	22,818	22,858	22,859	22,876	22,873	23,050	23,195	571	41
<b>Total Area Inventoried</b>	<b>1,073,254</b>	<b>1,073,252</b>	<b>1,073,252</b>	<b>1,073,252</b>	<b>1,073,252</b>	<b>1,073,264</b>	<b>1,073,264</b>	<b>1,073,261</b>	<b>7</b>	<b>1</b>

(1) Prior to the availability of digital soil data (SSURGO) in 2004, the county was mapped using Interim Farmland categories. See the 1988-2004 worksheet.

(2) Water acreage changed in 2006 due to improved delineation along the Sacramento River and addition of Philbrook Reservoir.

(3) Water acreage changed in 2016 due to improved delineation along the Sacramento River.

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PERCENTAGE OF COUNTY INVENTORIED: 100%

National Forest areas were added when soil survey data became available.

Source: Butte County Important Farmland Data Availability," accessed 07.22.21,  
<https://www.conservation.ca.gov/dlrp/fmmp/Pages/Butte.aspx>



# Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
100	Anita-Galt , 0 to 3 percent slopes	434	*
104	Bosquejo clay, 0 to 1 percent slopes	8,624	0.9
105	Busacca clay loam, 0 to 1 percent slopes	5,831	0.6
108	Tuscan-Igo-Anita , 0 to 3 percent slopes	1,058	0.1
109	Bosquejo clay loam, 0 to 1 percent slopes	789	*
110	Bosquejo silt loam, 0 to 1 percent slopes, overwash, occasionally flooded	213	*
111yu	Sobrante-Auburn loams, 8 to 15 percent slopes	158	*
114yu	Sobrante-Auburn gravelly loams, 8 to 15 percent slopes	205	*
118	Xerorthents, Tailings and 0 to 50 percent slopes	10,192	1.1
118co	Clear Lake clay, drained, 0 to 1 percent slopes, frequently flooded, MLRA 17	771	*
119	Xerorthents, tailings-Urban land complex, 0 to 2 percent slopes	1,905	0.2
119yu	Auburn-Sobrante-Rock outcrop, 30 to 50 percent slopes	58	*
120	Gridley taxadjunct clay loam, 0 to 2 percent slopes	4,125	0.4
121	Boga-Loemstone , 0 to 1 percent slopes	9,577	1.0
121su	Columbia fine sandy loam, 0 to 2 percent slopes, frequently flooded	164	*
125	Gridley taxadjunct-Calcic Haploxerolls , 0 to 2 percent slopes	2,594	0.3
126	Liveoak sandy loam, 0 to 2 percent slopes	2,186	0.2
127	Gridley taxadjunct loam, 0 to 2 percent slopes	10,245	1.1
130	Eastbiggs loam, 0 to 2 percent slopes	10,500	1.1
133	Eastbiggs-Galt , 0 to 3 percent slopes	2,085	0.2
136	Duric Xerarents-Eastbiggs , 0 to 1 percent slopes, leveled	6,371	0.7
138su	Liveoak sandy clay loam, 0 to 2 percent slopes	3,581	0.4
139su	Liveoak-Galt taxadjuncts , 0 to 2 percent slopes, frequently flooded	1,260	0.1
143su	Marcum-Gridley clay loams, 0 to 1 percent slopes	194	*
149yu	Flanly sandy loam, 8 to 15 percent slopes	7	*
150	Columbia, 0 to 2 percent slopes, frequently flooded	1,026	0.1
150su	Olashes sandy loam, 0 to 2 percent slopes	184	*
151yu	Flanly sandy loam, 30 to 50 percent slopes	161	*
152	Gianella fine sandy loam, 0 to 1 percent slopes, frequently flooded	1,514	0.2
153	Gianella sandy loam, 0 to 1 percent slopes, frequently flooded	694	*
154	Gianella silt loam, 0 to 1 percent slopes, frequently flooded	2,209	0.2
158	Gianella fine sandy loam, 0 to 1 percent slopes, occasionally flooded	9,554	1.0
160	Gianella loam, 0 to 1 percent slopes, occasionally flooded	991	0.1
161	Gianella fine sandy loam, 0 to 1 percent slopes, rarely flooded	3,152	0.3
162	Gianella loam, 0 to 1 percent slopes, rarely flooded	774	*
163yu	Holillipah loamy sand, 0 to 1 percent slopes, frequently flooded	92	*
165yu	Holland-Hoda-Hotaw , 2 to 30 percent slopes	42	*
173yu	Hotaw-Chawanakee-Holland , 8 to 30 percent slopes	3	*
175	Farwell clay loam, 0 to 1 percent slopes	1,639	0.2
176	Farwell loam, 0 to 1 percent slopes, occasionally flooded	930	0.1
176yu	Jocal loam, 8 to 15 percent slopes	41	*
177	Farwell silt loam, 0 to 1 percent slopes, occasionally flooded	1,215	0.1
178	Arbuckle gravelly loam, 0 to 2 percent slopes, MLRA 17	167	*
179	Moda taxadjunct-Arbuckle complex, 0 to 2 percent slopes	601	*
180	Dodgeland silty clay loam, 0 to 5 percent slopes, occasionally flooded	1,515	0.2
181	Dodgeland silty clay loam, 0 to 1 percent slopes, frequently flooded	1,420	0.2
188yu	Mariposa taxadjunct gravelly loam, 15 to 30 percent slopes	15	*
189	Esquon silt loam, 0 to 1 percent slopes, overwash	1,015	0.1
189yu	Mariposa taxadjunct gravelly loam, 30 to 50 percent slopes	1	*
196yu	Mildred cobbly loam, 30 to 50 percent slopes	13	*

\* See footnote at end of table.

## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
200	Parrott silt loam, 0 to 2 percent slopes, occasionally flooded	11,784	1.3
201	Parrott silt loam, 0 to 2 percent slopes, frequently flooded	1,237	0.1
203	Kusalslough silty clay loam, 0 to 1 percent slopes, occasionally flooded	685	*
205	Parrott-Vermet , 0 to 2 percent slopes, frequently flooded	1,691	0.2
206	Islandbar-Chawanakee , 3 to 15 percent slopes	2,190	0.2
207	Islandbar-Chawanakee , 15 to 30 percent slopes	2,421	0.3
208	Islandbar-Chawanakee , 30 to 50 percent slopes	815	*
209	Islandbar-Chawanakee , 50 to 70 percent slopes	39	*
210	Featherfalls-Islandbar , 2 to 15 percent slopes	2,291	0.2
211	Featherfalls-Islandbar , 15 to 30 percent slopes	3,792	0.4
212	Featherfalls-Islandbar , 30 to 50 percent slopes	3,922	0.4
213	Featherfalls-Islandbar , 50 to 70 percent slopes	1,741	0.2
214	Crystalhill-Oregongulch-Craigsaddle-Rock outcrop , 2 to 15 percent slopes	1,958	0.2
215	Crystalhill-Oregongulch-Craigsaddle-Rock outcrop , 15 to 30 percent slopes	4,227	0.5
216	Crystalhill-Oregongulch-Craigsaddle-Rock outcrop , 30 to 50 percent slopes	7,078	0.8
217	Crystalhill-Oregongulch-Craigsaddle-Rock outcrop , 50 to 70 percent slopes	2,564	0.3
218	Rock outcrop-Lithic Xerorthents-Chawanakee , 12 to 50 percent slopes	976	0.1
219	Rock outcrop-Lithic Xerorthents-Chawanakee , 50 to 70 percent slopes	206	*
220	Esquon-Clearlake , 0 to 1 percent slopes, frequently flooded	903	*
221yu	Sites silt loam, 2 to 9 percent slopes, N low montane	382	*
222yu	Sites silt loam, 9 to 15 percent slopes, N low montane	234	*
225yu	Sites gravelly loam, bedrock substratum, 3 to 8 percent slopes	24	*
226yu	Sites gravelly loam, bedrock substratum, 8 to 15 percent slopes	4	*
227yu	Sites gravelly loam, bedrock substratum, 15 to 30 percent slopes	15	*
242yu	Surnuf gravelly loam, 8 to 15 percent slopes	1,140	0.1
243yu	Surnuf gravelly loam, 15 to 30 percent slopes	1,574	0.2
244yu	Surnuf gravelly loam, 30 to 50 percent slopes	397	*
245	Surnuf gravelly loam, 50 to 70 percent slopes	305	*
248yu	Trainer loam, 0 to 1 percent slopes, occasionally flooded	768	*
250	Llanoseco silty clay loam, 0 to 2 percent slopes, occasionally flooded	307	*
252	Whitecabin-Ordery silty clays, 0 to 1 percent slopes, occasionally flooded	2,595	0.3
252yu	Woodleaf gravelly loam, 3 to 15 percent slopes	9	*
253yu	Woodleaf gravelly loam, 15 to 30 percent slopes	15	*
255	Whitecabin-Ordery , 0 to 1 percent slopes, occasionally flooded	853	*
256	Whitecabin silt loam, 0 to 1 percent slopes, occasionally flooded	123	*
257	Llanoseco silty clay loam, 0 to 1 percent slopes, frequently flooded	127	*
258	Codora silty clay loam, 0 to 1 percent slopes, occasionally flooded	5	*
260	Ordery silty clay, 0 to 1 percent slopes, occasionally flooded	742	*
280	Columbia very fine sandy loam, 0 to 1 percent slopes, frequently flooded	1,029	0.1
290	Perkins gravelly loam, 0 to 2 percent slopes	1,276	0.1
300	Redsluff gravelly loam, 0 to 2 percent slopes	7,019	0.8
301	Wafap-Hamslough , 0 to 2 percent slopes	3,132	0.3
302	Redtough-Redswale , 0 to 2 percent slopes	7,270	0.8
303	Munjar-Tuscan taxadjunct-Galt , 0 to 2 percent slopes	3,702	0.4
304	Redtough loam, 8 to 35 percent slopes	377	*
305	Redtough-Redswale-Anita, gravelly duripan, , 0 to 5 percent slopes	2,556	0.3
306	Duric Xerarents , 0 to 1 percent slopes	1,356	0.1
307	Duric Xerarents, 0 to 1 percent slopes	1,076	0.1
310	Kimball loam, 1 to 3 percent slopes	3,733	0.4
317	Thompsonflat loam, 2 to 15 percent slopes	4,571	0.5

\* See footnote at end of table.



## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
318	Thompsonflat-Oroville , 0 to 9 percent slopes	7,450	0.8
320	Vistarobles-Redding , 0 to 9 percent slopes	4,070	0.4
321	Durixeralfs-Typic Petraquepts , 0 to 2 percent slopes	1,869	0.2
330	Wilsoncreek-trainer loams, 0 to 2 percent slopes, occasionally flooded	2,916	0.3
331	Thompsonflat loam, 15 to 30 percent slopes	2,031	0.2
335	Galt clay loam, 0 to 1 percent slopes	198	*
336	Galt clay, 0 to 1 percent slopes	1,394	0.2
337	Galt clay loam, 0 to 1 percent slopes, leveled	910	*
338	Oxyaquic Xerofluvents silt loam and 0 to 1 percent slopes	2,053	0.2
339	Oxyaquic Xerofluvents sandy loam, 0 to 1 percent slopes and Frequently flooded	820	*
340	Rock outcrop-Thermalrocks-Campbellhills , 2 to 15 percent slopes	4,238	0.5
341	Elsely-Beatsonhollow-Campbellhills-Rock outcrop , 2 to 5 percent slopes	846	*
342	Thermalrocks-Beatsonhollow taxadjunct-Rock outcrop , 2 to 30 percent slopes	813	*
343	Coalcanyon-Coonhollow , 5 to 15 percent slopes	839	*
344	Coalcanyon-Coonhollow-Rock outcrop , 15 to 30 percent slopes	1,961	0.2
346	Cherotable-Elsely , 2 to 15 percent slopes	1,038	0.1
347	Haplic Palexeralfs loam, 0 to 5 percent slopes	851	*
353	Cherokeespring gravelly silt loam, 2 to 15 percent slopes	1,049	0.1
355	Coalcanyon-Talus , 15 to 30 percent slopes	391	*
356	Coalcanyon-Rock outcrop, cliffs-Talus-Coonhollow , 30 to 200 percent slopes	2,178	0.2
360	Typic Xerofluvents complex, 0 to 2 percent slopes	1,681	0.2
361	Typic Xerofluvents, sandy-skeletal, 0 to 2 percent slopes	469	*
362	Ultic Haploxeralfs, sandstone, low elevation, complex, 2 to 5 percent slopes	364	*
363	Ultic Haploxeralfs, sandstone, low elevation, complex, 5 to 15 percent slopes	465	*
364	Ultic Haploxeralfs, sandstone, low elevation complex 15 to 30 percent slopes	352	*
365	Palexerults, 15 to 30 percent slopes	1,779	0.2
366	Palexerults, 30 to 50 percent slopes	530	*
370	Palexerults, 2 to 15 percent slopes	1,519	0.2
375	Wickscorner loam, 2 to 10 percent slopes	1,194	0.1
376	Flagcanyon-Wickscorner , 2 to 5 percent slopes	2,049	0.2
377	Flagcanyon taxadjunct-Durixeralfs-Duraquerts , 0 to 5 percent slopes	1,016	0.1
400	Subaco taxadjunct clay, 0 to 1 percent slopes	7,609	0.8
415	Ignord fine sandy loam, 0 to 2 percent slopes	909	*
416	Calcic Haploxerolls, 0 to 1 percent slopes	220	*
418	Almendra loam, 0 to 1 percent slopes	13,052	1.4
419	Conejo fine sandy loam, 0 to 1 percent slopes, overwash	799	*
420	Conejo clay loam, 0 to 1 percent slopes	12,946	1.4
425	Vina fine sandy loam, sandy substratum, 0 to 2 percent slopes, MLRA 17	6,466	0.7
426	Vina loam, 0 to 2 percent slopes, MLRA 17	1,056	0.1
439	Oxyaquic Xerofluvents clay, 0 to 1 percent slopes, frequently flooded	780	*
440	Oxyaquic Xerofluvents silt loam, 0 to 1 percent slopes, frequently flooded	1,060	0.1
441	Oxyaquic Xerofluvents very fine sandy loam, 0 to 1 percent slopes	916	*
442	Durixerolls-haploxerolls clay loams and 0 to 2 percent slopes	2,303	0.3
443	Durixerolls-haploxerolls loams and 0 to 2 percent slopes	789	*
445	Chico loam, 0 to 1 percent slopes	4,785	0.5
447	Charger fine sandy loam, 0 to 1 percent slopes	2,176	0.2
448	Haploxerolls clay loam, 0 to 2 percent slopes	4,821	0.5
449	Haploxerolls loam, 0 to 2 percent slopes	3,802	0.4
500	Lofgren-Blavo , 0 to 1 percent slopes	30,310	3.3
501	Lofgren-Blavo , 0 to 1 percent slopes, occasionally flooded	14,032	1.5

\* See footnote at end of table.

## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
502	Blavo silt loam, 0 to 1 percent slopes, overwash, occasionally flooded	343	*
519	Edjobe silty clay, 0 to 1 percent slopes	3,818	0.4
520	Esquon-Neerdobe , 0 to 1 percent slopes	57,816	6.3
521	Neerdobe silt loam, 0 to 1 percent slopes, overwash	747	*
522	Clearlake silty clay loam, 0 to 1 percent slopes, overwash, frequently flooded	695	*
523	Esquon silty clay loam, 0 to 1 percent slopes, overwash, frequently flooded	926	0.1
525	Govstanford loam, 0 to 1 percent slopes	531	*
526	Govstanford loam, 0 to 1 percent slopes, occasionally flooded	702	*
528	Neerdobe clay loam, 0 to 1 percent slopes	549	*
550	Dunstone-loafercreek complex, dry, 1 to 15 percent slopes	6,520	0.7
551	Dunstone-Lomarica-Argonaut taxadjunct , 15 to 30 percent slopes	4,764	0.5
552	Dunstone-Loafercreek , 2 to 15 percent slopes	6,619	0.7
553	Dunstone-Loafercreek , 15 to 30 percent slopes	702	*
554	Dunstone-Loafercreek , 30 to 50 percent slopes	5,660	0.6
555	Dunstone-Loafercreek , 50 to 90 percent slopes	1,046	0.1
556	Mounthope-Hartsmill , 2 to 15 percent slopes	499	*
557	Mounthope-Hartsmill , 15 to 30 percent slopes	2,524	0.3
558	Hartsmill-Mounthope , 30 to 50 percent slopes	3,771	0.4
559	Hartsmill-Mounthope , 50 to 70 percent slopes	2,332	0.3
560	Hartsmill-Mounthope , 70 to 90 percent slopes	884	*
561	Bigridge-Minniecreek , 2 to 15 percent slopes	303	*
562	Bigridge-Minniecreek , 15 to 30 percent slopes	810	*
563	Bigridge-Minniecreek , 30 to 50 percent slopes	1,634	0.2
564	Bigridge-Minniecreek , 50 to 70 percent slopes	450	*
565	Dunstone-Argonaut taxadjunct-Sunnyslope , 2 to 15 percent slopes	4,147	0.5
566	Dunstone-Loafercreek-Katskillhill , 2 to 15 percent slopes	6,024	0.7
567	Dunstone-Loafercreek-Argonaut taxadjunct , 2 to 15 percent slopes	4,573	0.5
577	Parkshill-Flanly-Hurleton , 2 to 15 percent slopes	6,168	0.7
578	Flanly-Swedeflat , 2 to 15 percent slopes	4,489	0.5
580	Surnuf taxadjunct-Griffgulch-Rock outcrop , 2 to 15 percent slopes	523	*
581	Surnuf taxadjunct-Griffgulch , 15 to 30 percent slopes	1,453	0.2
582	Surnuf taxadjunct-Griffgulch , 30 to 50 percent slopes	641	*
583	Surnuf taxadjunct-Griffgulch , 50 to 70 percent slopes	769	*
584	Flanly-Swedeflat-Rackerby , 15 to 30 percent slopes	8,165	0.9
585	Flanly-Sommeyleft , 2 to 15 percent slopes	2,387	0.3
586	Sommeyleft-Mounthope , 15 to 30 percent slopes	2,497	0.3
587	Sommeyleft-Mounthope-Hurleton , 30 to 50 percent slopes	4,283	0.5
588	Ultic Haploxeralfs, thermic, high terrace, 2 to 15 percent slopes	2,962	0.3
589	Ultic Haploxeralfs, thermic, high terrace, 15 to 30 percent slopes	1,828	0.2
590	Vistarobles-Redding-Argonaut taxadjunct-Haploxererts , 0 to 9 percent slopes	6,244	0.7
603	Oroville-Thermalito-Fernandez-Thompsonflat complex, 0 to 9 percent slopes	12,658	1.4
605	Duric Xerarents-Oroville , 0 to 1 percent slopes, leveled	576	*
606	Redtough-Fallager-Anita, gravelly duripan , 0 to 3 percent slopes	2,611	0.3
609	Anita, gravelly duripan-Tuscan taxadjunct , 0 to 2 percent slopes	585	*
614	Doemill-Jokerst , 0 to 3 percent slopes	2,248	0.2
615	Doemill-Jokerst , 3 to 8 percent slopes	8,974	1.0
616	Jokerst-Doemill-Typic Haploxeralfs , 8 to 15 percent slopes	3,933	0.4
617	Jokerst-Doemill-Typic Haploxeralfs , 15 to 30 percent slopes	1,559	0.2
619	Carhart taxadjunct, 0 to 2 percent slopes	302	*
620	Doemill-Jokerst-Ultic Haploxeralfs, thermic complex, 3 to 8 percent slopes	4,672	0.5

\* See footnote at end of table.



## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
621	Doemill-Jokerst-Ultic Haploxerafals, thermic complex, 8 to 15 percent slopes	3,833	0.4
622	Xerorthents, shallow-Typic Haploxerafals-Rock outcrop, cliffs complex, 15 to 30 percent slopes	11,203	1.2
623	Xerorthents, shallow-Typic Haploxerafals-Rock outcrop, cliffs complex, 30 to 50 percent slopes	11,974	1.3
624	Ultic Haploxerafals, mesic-Rockstripe complex, 2 to 15 percent slopes	8,198	0.9
625	Ultic Haploxerafals, mesic-Rockstripe complex, 15 to 30 percent slopes	7,492	0.8
626	Ultic Haploxerafals-Rockstripe-Rock outcrop, cliffs ,30 to 50 percent slopes	11,401	1.2
627	Ultic Haploxerafals-Rockstripe-Rock outcrop, cliffs , 50 to 70 percent slopes	5,376	0.6
628	Rockstripe-Ultic Haploxerafals-Rock outcrop, cliffs , 70 to 100 percent slopes	2,016	0.2
629	Slideland gravelly loam, 3 to 15 percent slopes	619	*
630	Slideland gravelly loam, 15 to 30 percent slopes	388	*
631	Slideland gravelly loam, 30 to 50 percent slopes	253	*
632	Ultic Haploxerafals, Conglomerate complex and 3 to 15 percent slopes	119	*
633	Ultic Haploxerafals, conglomerate complex, 15 to 30 percent slopes	578	*
634	Ultic Haploxerafals, conglomerate complex, 30 to 50 percent slopes	853	*
635	Ultic Haploxerafals, conglomerate complex, 50 to 70 percent slopes	266	*
636	Ultic Haploxerafals, conglomerate complex, 70 to 100 percent slopes	35	*
637	Ultic Haploxerafals, sandstone, 3 to 15 percent slopes	22	*
638	Ultic Haploxerafals, sandstone, 15 to 30 percent slopes	59	*
639	Ultic Haploxerafals, sandstone, 30 to 50 percent slopes	47	*
640	Ultic Haploxerafals, sandstone, 50 to 70 percent slopes	83	*
641	Ultic Haploxerafals, sandstone, 70 to 100 percent slopes	173	*
642	Chinacamp gravelly loam, 3 to 15 percent slopes	519	*
643	Chinacamp gravelly loam, 15 to 30 percent slopes	2,085	0.2
644	Chinacamp gravelly loam, 30 to 50 percent slopes	1,338	0.1
645	Chinacamp gravelly loam, 50 to 70 percent slopes	325	*
646	Coalcanyon taxadjunct very gravelly loam, 3 to 15 percent slopes	73	*
647	Coalcanyon taxadjunct very gravelly loam, 15 to 30 percent slopes	593	*
648	Coalcanyon taxadjunct very gravelly loam, 30 to 50 percent slopes	688	*
649	Coalcanyon taxadjunct very gravelly loam, 50 to 70 percent slopes	219	*
650	Schott very gravelly loam, 3 to 15 percent slopes	691	*
651	Schott very gravelly loam, 15 to 30 percent slopes	2,067	0.2
652	Schott-Rock outcrop , 30 to 50 percent slopes	6,217	0.7
654	Coridge-Rock outcrop , 3 to 8 percent slopes	1,521	0.2
655	Coridge-Rock outcrop , 8 to 15 percent slopes	209	*
656	Rock outcrop, cliffs-Coalcanyon taxadjunct , 15 to 50 percent slopes	803	*
657	Bonneyridge-Chawanakee-Rock outcrop , 2 to 15 percent slopes	1,880	0.2
658	Bonneyridge-Chawanakee-Rock outcrop , 15 to 30 percent slopes	4,985	0.5
659	Bonneyridge-Chawanakee-Rock outcrop , 30 to 50 percent slopes	6,288	0.7
660	Bonneyridge-Chawanakee-Rock outcrop , 50 to 70 percent slopes	2,145	0.2
661	Millerridge-Boxrobber , 3 to 15 percent slopes	577	*
662	Millerridge-Boxrobber , 15 to 30 percent slopes	1,101	0.1
663	Millerridge-Boxrobber , 30 to 50 percent slopes	1,272	0.1
664	Millerridge-Boxrobber , 50 to 70 percent slopes	357	*
665	Surnuf-Bigridge , 3 to 15 percent slopes	806	*
666	Surnuf-Bigridge , 15 to 30 percent slopes	1,404	0.2
667	Surnuf-Bigridge , 30 to 50 percent slopes	1,410	0.2
668	Surnuf-Bigridge , 50 to 70 percent slopes	670	*
669	Oroshore-Mounthope-Dunstone , 3 to 15 percent slopes	1,981	0.2
670	Oroshore-Mounthope-Dunstone , 15 to 30 percent slopes	3,799	0.4
671	Oroshore-Mounthope-Dunstone , 30 to 50 percent slopes	3,793	0.4

\* See footnote at end of table.

## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
672	Oroshore-Mounthope-Dunstone , 50 to 70 percent slopes	1,942	0.2
674	Chawanakee-Bonneyridge-Rock outcrop , 70 to 110 percent slopes	968	0.1
675	Clearhayes-Hamslough , 0 to 2 percent slopes	3,090	0.3
676	Carhart-Anita taxadjunct , 0 to 12 percent slopes	3,739	0.4
677	Tuscan-Fallager-Anita, gravelly duripan , 0 to 3 percent slopes	5,661	0.6
679	Lucksev-Butteside-Carhart , 2 to 15 percent slopes	7,776	0.8
680	Lucksev-Butteside , 15 to 35 percent slopes	2,789	0.3
683	Typic Haploxerafs, magnesian, low elevation-Earlal-Rock outcrop complex, 3 to 15 percent slopes	102	*
684	Typic Haploxerafs, magnesian, low elevation-Earlal-Rock outcrop complex, 15 to 30 percent slopes	191	*
685	Bosquejo taxadjunct clay, 0 to 2 percent slopes	624	*
686	Redsluff taxadjunct clay loam, 0 to 2 percent slopes	853	*
687	Xerorthents, shallow-Typic Haploxerafs complex, 2 to 15 percent slopes	2,196	0.2
700	Retsongulch-Flumewall , 70 to 100 percent slopes	1,533	0.2
701	Powellton-Obstruction , 50 to 70 percent slopes	788	*
702	Cerpone-Typic Haploxerafs, magnesian-Earlal complex, 3 to 15 percent slopes	247	*
703	Cerpone-Typic Haploxerafs, magnesian-Earlal-Rock outcrop complex, 15 to 30 percent slopes.	1,593	0.2
704	Typic Haploxerafs, magnesian-Earlal-Cerpone-Rock outcrop complex, 30 to 50 percent slopes	3,369	0.4
705	Typic Haploxerafs, magnesian-Earlal-Cerpone-Rock outcrop complex, 50 to 80 percent slopes	1,878	0.2
711	Dixmine-Toadtown , 3 to 15 percent slopes	18	*
712	Dixmine-Toadtown , 15 to 30 percent slopes	556	*
713	Dixmine-Toadtown , 30 to 50 percent slopes	688	*
714	Dixmine-Toadtown , 50 to 70 percent slopes	575	*
715	Logtrain-Bottlehill-Walkermine , 70 to 110 percent slopes	1,113	0.1
716	Griffgulch-Surnuf , 3 to 15 percent slopes	269	*
717	Griffgulch-Surnuf , 15 to 30 percent slopes	1,572	0.2
718	Griffgulch-Surnuf-Spine taxadjunct , 30 to 50 percent slopes	4,108	0.4
719	Griffgulch-Surnuf-Spine taxadjunct , 50 to 70 percent slopes	1,421	0.2
720	Dystroxerepts-Haploxerafs-Rock outcrop , 70 to 110 percent slopes	3,822	0.4
721	Haploxerands, granitic till, 2 to 15 percent slopes	729	*
722	Haploxerands, granitic till, 15 to 30 percent slopes	968	0.1
723	Haploxerands, granitic till, 30 to 50 percent slopes	474	*
724	Haploxerands, volcanic till, 2 to 15 percent slopes	476	*
725	Haploxerands, volcanic till, 15 to 30 percent slopes	1,053	0.1
726	Haploxerands, volcanic till, 30 to 50 percent slopes	560	*
727	Bonneyridge sandy loam, 1 to 15 percent slopes	1,075	0.1
728	Bonneyridge sandy loam, 15 to 30 percent slopes	1,666	0.2
729	Bonneyridge sandy loam, 30 to 50 percent slopes	556	*
730	Tusccoll-Schott , 30 to 50 percent slopes	3,637	0.4
731	Tusccoll-Schott , 50 to 70 percent slopes	2,415	0.3
732	Bonepile taxadjunct, 2 to 8 percent slopes	654	*
733	Haploxerafs, terrace, 0 to 5 percent slopes	530	*
734	Haploxerands-Aquic Xerofluvents , 0 to 15 percent slopes	713	*
735	Fluvaquents, loamy, 0 to 3 percent slopes	241	*
801	Obstruction gravelly sandy loam, 3 to 15 percent slopes	1,354	0.1
802	Obskel-Obstruction , 15 to 30 percent slopes	3,353	0.4
803	Obskel-Obstruction , 30 to 50 percent slopes	4,923	0.5
804	Obskel-Obstruction-Retsongulch , 50 to 70 percent slopes	3,134	0.3
805	Bottlehill-walkermine-logtrain complex, 3 to 15 percent slopes	509	*

\* See footnote at end of table.



## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
806	Bottlehill-Walkermine-Logtrain , 15 to 30 percent slopes	1,739	0.2
807	Bottlehill-Logtrain-Walkermine , 30 to 50 percent slopes	3,485	0.4
808	Bottlehill-Walkermine-Logtrain , 50 to 70 percent slopes	2,949	0.3
809	Walkermine-Bottlehill-Logtrain-Rock outcrop , 70 to 110 percent slopes	1,048	0.1
810	Dixmine-Mac-Spine , 30 to 50 percent slopes	2,027	0.2
811	Powellton-Toadtown , 3 to 15 percent slopes	1,297	0.1
812	Powellton-Toadtown , 15 to 30 percent slopes	3,097	0.3
813	Powellton-Toadtown , 30 to 50 percent slopes	2,579	0.3
814	Mountyana gravelly loam, 2 to 15 percent slopes	8,095	0.9
815	Mountyana gravelly loam, 15 to 30 percent slopes	3,130	0.3
817	Lydon very gravelly medial coarse sandy loam, 2 to 15 percent slopes	377	*
818	Lydon very gravelly medial coarse sandy loam, 15 to 30 percent slopes	506	*
819	Lydon-Rock outcrop , 30 to 50 percent slopes	2,006	0.2
820	Lydon-Rock outcrop , 50 to 70 percent slopes	358	*
821	Lydon-Rock outcrop , 70 to 100 percent slopes	175	*
822	Bonepile gravelly medial loam, 2 to 15 percent slopes	2,952	0.3
823	Bonepile gravelly medial loam, 15 to 30 percent slopes	1,978	0.2
824	Beecee very gravelly medial loam, 30 to 50 percent slopes	8,807	1.0
825	Beecee-lydon complex, 50 to 70 percent slopes	2,347	0.3
826	Redbone gravelly medial sandy loam, 3 to 15 percent slopes	3,179	0.3
827	Redbone gravelly medial sandy loam, 15 to 30 percent slopes	1,519	0.2
829	Paradiso loam, 2 to 15 percent slopes	17,694	1.9
830	Paradiso loam, 15 to 30 percent slopes	3,545	0.4
831	Surnuf-BigrIDGE-Spine , 3 to 15 percent slopes	886	*
832	Surnuf-BigrIDGE-Spine , 15 to 30 percent slopes	1,185	0.1
833	Surnuf-BigrIDGE-Spine , 30 to 50 percent slopes	837	*
834	Hietanen-Mac , 3 to 15 percent slopes	233	*
835	Hietanen-Mac , 15 to 30 percent slopes	544	*
836	Hietanen-Mac-Spine , 30 to 50 percent slopes	1,648	0.2
837	Hietanen-Spine-Mac , 50 to 70 percent slopes	1,419	0.2
838	Dixmine-Spine-Mac , 50 to 70 percent slopes	2,649	0.3
839	Chawanakee-Billscabin , 2 to 15 percent slopes	311	*
841	Billscabin-Bonneyridge , 30 to 50 percent slopes	937	0.1
842	Billscabin-Bonneyridge , 50 to 70 percent slopes	1,158	0.1
846	Bonneyridge-Lewisflat , 2 to 15 percent slopes	957	0.1
847	Bonneyridge-Lewisflat , 15 to 30 percent slopes	4,540	0.5
848	Bonneyridge-Lewisflat , 30 to 50 percent slopes	3,968	0.4
850	Lewisflat loam, 2 to 15 percent slopes	569	*
851	Lewisflat loam, 15 to 30 percent slopes	1,236	0.1
852	Lewisflat loam, 30 to 50 percent slopes	420	*
860	Toadtown-Powellton , 2 to 15 percent slopes	3,296	0.4
861	Toadtown-Powellton , 15 to 30 percent slopes	6,272	0.7
862	Toadtown-Powellton , 30 to 50 percent slopes	1,768	0.2
863	Toadtown-Powellton , 50 to 70 percent slopes	735	*
880	Sites-Jocal taxadjuncts, 2 to 15 percent slopes	1,200	0.1
881	Sites-Jocal taxadjuncts, 15 to 30 percent slopes	1,685	0.2
882	Sites-Jocal taxadjuncts, 30 to 50 percent slopes	1,392	0.2
883	Sites-Jocal taxadjuncts, 50 to 70 percent slopes	90	*
885	Rogerville silt loam, 2 to 15 percent slopes	1,383	0.2
886	Rogerville silt loam, 15 to 30 percent slopes	1,605	0.2

\* See footnote at end of table.

## Acreage and Proportionate Extent of the Soils

Butte Area, California, Parts of Butte and Plumas Counties

Map symbol	Map unit name	Acres	Percent
892	Rogerville silt loam, 50 to 70 percent slopes	110	*
893	Rogerville silt loam, 30 to 50 percent slopes	364	*
902	Lava flows-Lumpkin , 0 to 15 percent slopes	482	*
903	Mudwash-Timberisland-Lavatop , 2 to 30 percent slopes	2,125	0.2
904	Lava flows-Lavatop , 15 to 30 percent slopes	124	*
905	Lava flows-Lumpkin , 30 to 50 percent slopes	201	*
906	Lava flows-Lumpkin , 50 to 70 percent slopes	112	*
911	Endoaquolls, 0 to 8 percent slopes	213	*
923	Powderhouse-McNair-Greenwell , 2 to 15 percent slopes	1,249	0.1
924	Powderhouse-McNair-Greenwell , 15 to 30 percent slopes	2,158	0.2
925	Powderhouse-McNair-Greenwell , 30 to 50 percent slopes	1,650	0.2
930	Shakeridge-Timberisland , 0 to 15 percent slopes	267	*
931	Shakeridge-Mudwash-Timberisland , 15 to 30 percent slopes	1,587	0.2
932	Shakeridge-Mudwash , 30 to 50 percent slopes	866	*
933	Shakeridge gravelly medial sandy loam, 50 to 70 percent slopes	138	*
934	Mudwash gravelly medial sandy loam, 0 to 15 percent slopes	1,001	0.1
939	Fluvaquentic Humaquepts and 0 to 15 percent slopes	268	*
940	Dejonah-Stagpoint , 2 to 15 percent slopes	1,000	0.1
941	Dejonah-Stagpoint , 15 to 30 percent slopes	2,236	0.2
942	Stagpoint-Dejonah , 30 to 50 percent slopes	2,759	0.3
948	Stagpoint-Dejonah , 50 to 70 percent slopes	268	*
949	Rogerville taxadjunct, 30 to 50 percent slopes	181	*
950	Lumpkin taxadjunct-Rock outcrop-Powderhouse , 0 to 15 percent slopes	412	*
951	Lumpkin taxadjunct-Rock outcrop-Powderhouse , 15 to 30 percent slopes	136	*
960	Surnuf gravelly loam, 3 to 8 percent slopes, high elevation	994	0.1
961	Surnuf gravelly loam, 8 to 15 percent slopes, high elevation	132	*
962	Surnuf gravelly loam, 15 to 30 percent slopes, high elevation	250	*
963	Surnuf gravelly loam, 30 to 50 percent slopes, high elevation	269	*
990	Riverwash, 0 to 2 percent slopes frequently flooded	1,835	0.2
991	Xerofluvents and 0 to 4 percent slopes frequently flooded	1,788	0.2
995	Pits, gravel	84	*
996	Dumps, excavated material	179	*
997	Pits	742	*
998	Dumps, landfill	95	*
999	Water	21,757	2.4
DAM	Dams	192	*
Total		930,752	101.3

\* Less than 0.1 percent.



## Appendix J: Damage by Seedling and Fire Mortality on Forestland

Information from USDA's Natural Resources Conservation Service:

- Post-Fire Disaster Assistance:  
<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/newsroom/features/?cid=nrcseprd1287608>
- Forestry: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/ca/technical/landuse/forestry/>
- Table of Damage by Seedling and Fire Mortality on Forestland:
- Recovering from Wildfire: A Guide for California's Forest Landowners:  
<https://anrcatalog.ucanr.edu/pdf/8386.pdf>

## Appendix K

### Regenerative Agriculture

Regenerative agriculture is as much a philosophy as it is a practice. It is a collection of farming and ranching practices focused on soil rehabilitation, conservation, biodiversity, and having a net positive impact on climate change. Butte County is fortunate to be home to The Center for Regenerative Agriculture and Resilient Systems (CRARS) at CSU Chico. Currently President Gayle Hutchinson has made Chico's goal to become a climate-neutral campus by the year 2030. "Because of the global reach that Chico State has the potential to encourage and role model successful practices for agricultural farming. This mission plans to solve the 'unprecedented challenges of the 21st century.'" CSU Chico is taking place in more than fifteen practices in regenerating their agriculture. Cover cropping are plants that are used in-between profitable crops. This helps with fertilizing and improving the quality of the soil. These crops improve weed management by taking their place, decreasing pests and diseases, and increasing biodiversity. These crops may also be used further down the season as biomass bringing even more nutrients back into the soil as they are recycled.

Crop rotation is an effective way to reduce soil depletion and decrease soil erosion which destroys other ecosystems. As this campus successfully rotates crops, they supply nutrients for the next season's crops.

The next contribution for regeneration are soil amendments and inoculants. These amendments consist of compost, biochar, manure and mulch. By reusing organic matter from old fruits and vegetables and bio-waste from animals improves crop yields and brings biodiversity back into the soil. Inoculants are used to help grow microbial abundance and fungal ratios, which allows farmers to use less synthetic fertilizers.

No-till practices are starting to be implemented for crops that can be avoided. Tilling practices can destroy soil structure and expose too much air and sunlight for the soil's moisture retaining factors. "No-till practices protect the soil surface, so water tends to infiltrate instead of running off. It is also used to help maintain and support the soil biology, with benefits in terms of fungal relationships essential for nutrient uptake and carbon sequestration."

Adaptive grazing and regenerative ranching is strictly about controlling the amount of time and amount of pasture being grazed. Ranchers at Chico State must calculate how long livestock may graze for depending on current conditions, environment feedback, and their goals and objectives. The animals eat only a partial part of the vegetation in packed groups and their hooves will mix up their manure and urine with the top soil- overall improving the conditions of the soil. Also the methane and carbon will not be released because the vegetation will be standing. Another help for livestock is multi-species grazing. This brings variation for the animals, environment and more carbon sequestration.

Chico State promotes raising livestock and crops together in a mutually beneficial manner and providing fresh nutrients to the animals. This decreases labor and machinery costs, helping the no-tilled methods by once again having their hooves mix the soil together with their manure. Not only does this require less machinery, it decreases imported feed costs.

Rangeland Seeding requires land to grow self-sustaining plants like legumes, grasses and shrubs that permit more grazing. This helps livestock but also builds the soil structure placing roots deep into the ground each year and water infiltration throughout. Chico state does their best in mixing seeds of native species to increase biodiversity.

Planting hedgerows and pollinator habitat is another beneficial practice done at Chico State that brings new insects and wildlife to an area, while storing carbon in the soil. The most critical need for hedgerows is providing habitat for pollinators, as these critical animals and insects have declined due to habitat loss (development) and pesticide use. Hedgerows can be perennial grasses and shrubs that are placed at the edges of fields and have the additional benefit of breaking wind. Ranchers and farmers are discovering new ways to make it a cash crop while adding beauty to distinct ends of their property.

The practice that benefits from floods and erosion is riparian planting, buffer and filter strips. These vegetation buffers that serve habitat for wildlife that provide carbon sequestration. Silvo Pastures incorporate trees, pastures and forage crops for livestock to be raised in. These trees help store five to 10 times more carbon in biomass than pastures with no agroforestry and supply shade and a diverse food source for the animals. These trees can also be for growing nuts, fruits, and mushrooms. The land is more resilient and healthier meat and dairy from the livestock. The last practice is Alley cropping, otherwise known as intercropping. These crops are planted in a row with a companion crop in between. These are used as cash crops while reducing surface water runoff and wind erosion.

Chico State's priorities are to conduct applied research on regenerative food production systems to fill gaps in our understanding of farming practices. They want to establish a national network for regenerative agriculture that includes academics, extension, farmers, ranchers, nonprofit organizations, agency personnel to coordinate local food networks to local consumers.



## Appendix L

### Butte County Agriculture Sector Growth and Earnings

Tables 1 & 2. Agriculture Sector Employment and Projected Growth (Source: NoRTEC Labor Market Analysis 2019<sup>1</sup>)

Occupation	2018 Employment	Change 2013-2018		Projected Change 2018-2023		Median Hourly Earnings
Miscellaneous Agricultural Workers	1,730	45	3%	41	2%	\$12.04
Farmers, Ranchers, and Other Agricultural Managers	580	47	9%	29	5%	\$25.78
Graders and Sorters, Agricultural Products	156	15	11%	3	2%	\$11.55
Laborers and Material Movers, Hand	110	20	22%	10	9%	\$12.68
First-Line Supervisors of Farming, Fishing, and Forestry Workers	97	19	24%	11	11%	\$34.73
Driver/Sales Workers and Truck Drivers	89	2	2%	3	3%	\$17.38
Packaging and Filling Machine Operators and Tenders	48	21	78%	(1)	(2%)	\$14.91
Forest and Conservation Workers	44	23	110%	10	23%	\$11.52
Grounds Maintenance Workers	44	5	13%	5	11%	\$13.36
Logging Workers	42	7	20%	(2)	(5%)	\$23.12
Secretaries and Administrative Assistants	40	5	14%	(1)	(3%)	\$16.86
Bookkeeping, Accounting, and Auditing Clerks	31	1	3%	0	0%	\$18.70
Industrial Truck and Tractor Operators	25	4	19%	1	4%	\$19.78
Nonfarm Animal Caretakers	25	3	14%	1	4%	\$12.57
Miscellaneous Production Workers	23	7	44%	4	17%	\$13.39
Sales Representatives, Wholesale and Manufacturing	23	(1)	(4%)	0	0%	\$22.36
Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics	23	3	15%	0	0%	\$24.88
Office Clerks, General	22	3	16%	(1)	(5%)	\$14.41
Maintenance and Repair Workers, General	21	3	17%	1	5%	\$16.93
Animal Trainers	20	4	25%	1	5%	\$11.81

Industry	2018 Jobs	'13-'18 Change	CE '13-18	'18-'23 Change	CE '18-23	'18 LQ	Average Earnings
Crop Production	2,193	(37)	17	39	37	4.63	\$50,693
Support Activities for Crop Production	934	169	112	31	(37)	3.21	\$52,657
Support Activities for Forestry	156	113	104	63	41	12.43	\$64,142
Animal Production	131	46	44	13	16	0.52	\$53,710
Logging	87	6	11	(8)	(1)	2.13	\$52,976
Support Activities for Animal Production	55	(11)	(17)	7	3	2.19	\$22,840
Fishing	12	2	3	0	1	0.71	\$35,626
Timber Tract Operations	<10	Insf. Data	1	Insf. Data	0	0.36	Insf. Data
Forest Nurseries and Gathering of Forest Products	<10	Insf. Data	5	Insf. Data	1	4.80	Insf. Data
Hunting and Trapping	<10	Insf. Data	1	Insf. Data	(1)	1.93	Insf. Data

<sup>1</sup> <https://www.ncen.org/images/documents/lmi/regional-profiles/2019/Butte%20County%20Report.pdf>

## Appendix M

### Food Policy and Regulations

#### a) Federal Inspection

Federal Meat Inspection Act (FMIA), requires all meat sold commercially be inspected and passed to ensure safe, wholesome, and properly labeled. USDA Food Safety and Inspection Service (FSIS) is responsible for inspection of livestock: cattle, sheep, swine, and goat carcasses for human consumption. Federal personnel must be present at all times during slaughter operations, and verify handling of animals is fit for slaughter. Officials also inspect post-mortem to ensure that the meat from the carcass and internal organs are fit for consumption. Food products like non- amenable species are inspected by the U.S. Food and Drug Administration (FDA) and state and local authorities. Authorities follow written Sanitation Standard Operating Procedures (SSOP) and Hazard Analysis and Critical Control Point (HACCP) plans, as well as inspect the facilities and their equipment.<sup>1</sup>

#### b) State Inspection

Unless regulated by a State Meat and Poultry Inspection (MPI) program, an establishment must be inspected federally. MPI programs are required to enforce “at least equal to” inspections from the Federal Acts. State MPI programs are annually certified and provide personalized guidance to operations within the state. FSIS reviews each state’s program, provides guidance, and provides up to 50% of funding.<sup>2</sup>

#### c) Personal/Individual Use Exemption

A person may prepare livestock of their raising for their own family and non paying guests without the necessity of inspection. No livestock may be sold commercially under this exemption.

#### d) Custom Exemption

Custom exemption allows for the slaughter and preparation of livestock belonging to someone else for the exclusive consumption of that person. Such facilities are exempt from the FMIA requirement for carcass-by-carcass inspection and daily inspector presence. They are periodically verified for facility safety, cleanliness, and compliance with FMIA.

#### e) Farm Bill

Every five years there are new farm bills with unique names and revamped regulations. The current bill is called the Agriculture Improvement Act of 2018 and will expire in 2023.<sup>3 4</sup> The bill covers topics such as commodity support, conservation, trade and international food aid, nutrition assistance, farm credit, rural development, research and extension activities, forestry, energy, horticulture, crop insurance, livestock, agriculture and food defense, and historically underserved producers. The bill does not cover farm or food worker rights and protections, public land grazing rights, irrigation water rights, Food and Drug Administration (FDA) food safety, renewable fuels standards, taxes, school meals, The Women, Infants, and Children (WIC) program, some pesticide laws, and the Clean Water Act.<sup>5</sup>

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<sup>1</sup> <https://www.fsis.usda.gov/policy/food-safety-acts/federal-meat-inspection-act>

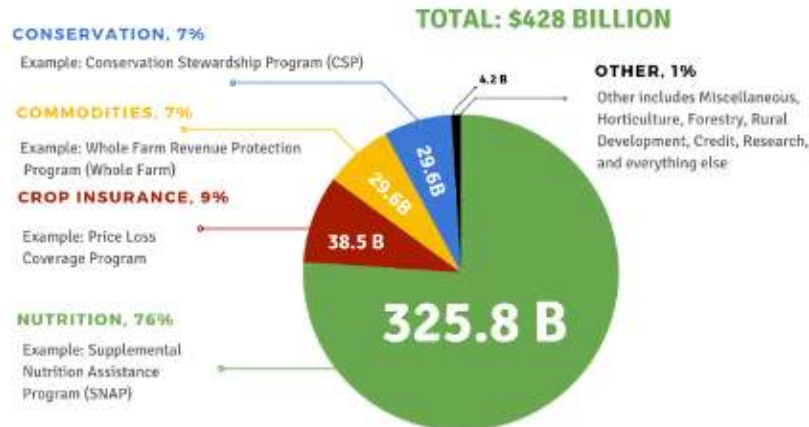
<sup>2</sup> <https://www.fsis.usda.gov/inspection/apply-grant-inspection/state-inspection-programs>

<sup>3</sup> <https://www.usda.gov/farmbill>

<sup>4</sup> <https://crsreports.congress.gov/product/pdf/R/R45525>

<sup>5</sup> <https://sustainableagriculture.net/our-work/campaigns/fbcampaign/what-is-the-farm-bill/>

## FARM BILL PROJECTED FUNDING, IN BILLIONS 2019-2023



### f) Farm Worker Modernization Act

The Farm Worker Modernization Act is an effort to stabilize the agricultural workforce.<sup>6</sup> Accordingly, farmworkers who have lived in the U.S. without authorization and worked in agriculture for years could qualify for green cards. The legislation would also reform the visa program for agricultural guest workers and eventually require all agricultural employers to use E-Verify, an electronic system for checking authorization to work in the U.S., when hiring. The bill also offers an electronic platform for processing H-2A cases. The H-2A temporary agricultural program allows employers to hire nonimmigrant foreign workers, on a temporary or seasonal nature, in anticipation of seasonal workforce shortages.<sup>7</sup> The legislation reforms the visa program for agricultural guest workers and will eventually require all agricultural employers to use an electronic system for checking authorization to work in the U.S. when hiring. It is the most comprehensive agriculture immigration reform bill in over 30 years.<sup>8</sup>

<sup>6</sup> <https://www.congress.gov/bill/117th-congress/house-bill/1603>

<sup>7</sup> <https://www.dol.gov/agencies/eta/foreign-labor/programs/h-2a>

<sup>8</sup> <https://www.kpbs.org/news/2021/mar/29/california-farmworkers-legal-status-new-bill/>



## g) American Rescue Plan Act of 2021

The American Rescue Plan Act of 2021 aids the agriculture sector through financial support to the socially disadvantaged, among other things. More than \$10 billion is appropriated to purchase and distribute agricultural products such as fresh produce, milk and dairy products, seafood, eggs, and meat to individuals in need domestically and abroad, assist in COVID-19 mitigation efforts for agricultural workers, improve rural health care, and provide debt forgiveness for socially disadvantaged farmers and ranchers.<sup>9</sup> It's estimated that \$4 billion will be used to provide direct payments of up to 120% of a socially disadvantaged (e.g., Black, Hispanic, Native American or Asian American) farmer's or rancher's outstanding debt as of Jan. 1, 2021. The legislation went into effect on March 11th, 2021 and includes USDA Farm Service Agency direct farm loans, USDA guaranteed loans, and Commodity Credit Corporation farm storage loans, among others. The additional 20% is intended to pay off the taxes associated with the amount of the direct payment related to the outstanding debt.

## 2. Challenges in Food Production

Climate change and associated climatic events including wildfire and drought present some of the greatest challenges faced by Butte County food producers, especially for small scale family operations which make up the bulk of the county's farms. Wildfire, smoke, and ash harm crop and animal production, negatively impact soil and water quality, and create a high-risk environment for agricultural workers.<sup>10</sup> Increased reliance on groundwater pumping during drought years and inadequate recharge threatens the sustainability of current water application methods for crop cultivation and reduces the availability of lush grassland for livestock forage.

The COVID-19 pandemic has led to supply chain irregularities, labor shortages, and unexpected changes in the consumer market. Farms operate within tight profit margins due to large operational expenses, leaving farmers with little wiggle room to overcome and adapt to a world of escalating environmental and economic stress. Moreover, large start-up costs and the aging out of farmers threatens the continuation and vitality of local food production, especially for small and generational farms. Overall, there has been stagnant growth in the agriculture sector compared to other industries in Butte County.<sup>11</sup>

Increased housing needs and the conversion of agricultural land to urban development has led to a slow but noticeable reduction in the total available acreage for agricultural use. Some producers have reported challenges in remaining competitive, establishing a reliable customer base, and increasing public interest in locally produced food. Additionally, the extensive red tape and costs associated with organic certification is a barrier for many producers, limiting their reach to consumers that demand the designation.

Moreover, several small producers do not feel that their interests are adequately represented by local governing agencies and policy makers.

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<sup>9</sup> <https://www.fb.org/market-intel/whats-in-the-american-rescue-plan-act-of-2021-for-agriculture>

<sup>10</sup> <https://aghealth.ucdavis.edu/research/wildfires>

<sup>11</sup> <https://www.ncen.org/images/documents/lmi/regional-profiles/2019/Butte%20County%20Report.pdf>

## Appendix N

### Perspectives from Local Producers

Before the tech boom, before Hollywood, California was and continues to be known as an agricultural epicenter not only of the United States but of the world. The International Ag Expo in the City of Tulare draws tens of thousands of agriculturists — farmers, ranchers, scientists, engineers, advisors and researchers — from all over the world. Tulare dairies and orchards set a precedent for agriculture in California. Lesser known is the agricultural importance of Butte County. Rather than milk and oranges, Butte County is best known for almonds, rice, walnuts, and prunes (ButteCoAg), and is home to one of the most well-known organic rice producers, Lundberg, residing in the town of Richvale on the west side of the county. Yet in recent years, more and more farmland has been converted to water-intensive crops such as almonds and walnuts in place of historic or alternative crops and growing methods in the county. Water, long a concern for central valley and inland empire counties further south, is now a central concern for Butte County. Other concerns such as suburban development and climate change are a continual challenge. Longer and more intense drought, wildfires, and the resulting change of demographics and loss of infrastructure have imperiled both the environment and farmers. The following section tells first hand accounts of the unique challenges faced by small local producers within Butte County.

#### *The Camp Fire*

“Down to the screwdriver,” Cheetah emphasized. Cheetah and Sammy, partners and producers for Turkey Tail Farm, run a forty-acre diversified farm that operates as a ranch, mushroom farm, apothecary, and cut flower farm. Making time for this interview was likely the first break they had in months. The Camp Fire of 2018 went through the foothills of their property in Yankee Hill, and within hours resulted in the loss of all their tools and infrastructure, down to the screwdriver. They might have lost their beautiful blue and black oaks, too, if not for the diligent grazing of their sheep and pigs which kept the forage down and reduced the fire intensity of the land. The livestock not only survived the fire but remained throughout the evacuation order. When Sammy and Cheetah returned to assess the fire damage, their sheep greeted them, covered with ash and in grave need of a shearing.

Despite great loss, the fire had a mobilizing effect. Although Turkey Tail Farm is a first generation agribusiness, the support shown during the recovery was as though they were an icon of their foothill community. The County Agricultural Commissioner offered exemptions for farms within the burn scar and evacuation zone, allowing access to their property to maintain crops and care for livestock. Their first action was to pen their flock who were loose but had faithfully remained near the property. However, forage was hard to come by. Due to the widespread loss and undesirable post-fire conditions Turkey Tail made the decision to bring their animals to market. Having lost cold storage and other refrigeration, S&L meats and others graciously offered space in their freezers for storage.

The Camp Fire had an intense impact throughout the county. In the end, over 150,000 acres burned, a comparatively small fraction of which, about 40,000 acres, were farmland.<sup>1</sup> Although the majority of farms in Butte County were not directly burned, both the Camp Fire of

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<sup>1</sup> <https://www.agalert.com/story/?id=12330>

2018 and the 2020 Bear Fire of the North Complex, had lingering impacts beyond the loss of homes, lives, and land. Many farmers on the ridge who traditionally grow apples and pears or range cattle depend on the community of people who live and work on the ridge. When the fire came, many were displaced and sorting through the aftermath of their forever-transformed lives. Labor shortages resulted and the following seasons ahead were incredibly challenging for ridge farmers.

The spring following the Camp Fire brought such challenges for the Nobles of Noble Orchards. What would normally be considered a blessing, an unusually generous wet season compounded issues for them. The defoliated land gave way to sheets of water eroding downhill, while at the same time, ample water kept the blossoms healthy on Noble's apple and pear trees. Every single fruit had set on their trees. With nearly all their tools burned, what normally would be ideal conditions for prepared farmers became a race to save the orchard. Every growing season, fruit must be thinned, and extraneous, weak branches must be removed or cut back. Without this, a healthy apple tree will sag down from the burden of too many apples on thin branches. Without essential tools like pruners, the Nobles had to work with what they had and improvise to keep their trees healthy. Even still they took losses. Normally a bumper crop year, Noble Orchards decided to invite people to pick their own fruit for free, relieving some of the pressures on the trees and providing a generous offering for a fire-torn community. The strategy worked and their trees received partial care from their customers, neighbors, and families from as far as the San Francisco Bay Area. Last year, Noble Orchards restored the health of their orchard and look forward to an even better harvest this year as they host their u-pick and attend the Chico Certified Farmers Market (ChicoER).

Among orchard farmers and ranchers of the foothill range are beekeepers. Wofchuk Apiaries lost over half their hives in the Camp Fire and were hit again when the Bear Fire swept through Berry Creek two years later. The setbacks have restricted his operation to a local only customer base. The breeding stock is down by 60% since 2018 and takes up to three years to catch up. If next year follows in this climate, they will only have enough breeding stock for grassland management and none for production. Wofchuk has concerns about the overall quality of beekeeping in California as the available nectar seems to be declining with drier conditions in the wildflower-covered foothills and mountains. Beekeepers have no shortage of work during the late winter and spring for nut and stone fruit tree orchards, yet with reduced food sources and increased risk from frequent wildfire, there is less reason for beekeepers to base their production out of California. Consequently, Wofchuk looks toward educating homeowners with small orchards or gardens on how to raise and care for their own honeybees, ensuring honeybees can continue to pollinate locally grown food.

All farmers interviewed were impacted by the recent wildfires. Noble Orchards had on average 200 customers per day at their farmstand during peak season, the majority from Paradise, Magalia and Skyway. The fire resulted in a major loss to their regular customer base. Small heirloom orchards such as the Myers family orchard in Paradise, on 3-acres of what was once a 30-acre orchard planted in the early 1900's, went fallow as the families rebuilt. Even farms not on the burn scar were affected by the environmental impacts of ash, runoff from the unusually wet season following the Camp Fire, and the loss of customers. Farmer Ha Moua struggled with ash and customer loss during the wildfires, yet remains happy with their prospects and livelihood.

Despite this, the community energy of the recovery helped rebuild local farms and ranches. Noble Orchards received an outpouring of community support and continues to receive local customers through their Victory Garden Nursery, a new service intended to help restore

the landscape of the ridge. Federal aid was mobilized to partially compensate farmers, ranchers, and producers for their losses, and exemptions to evacuation orders were granted to allow access for crop and livestock care.

### *COVID-19 Pandemic*

The COVID-19 pandemic was another majorly impactful event for farmers. The pandemic affected sanitation and transportation procedures for producers everywhere. Shipments were delayed. Market closures reduced consumer demand. Workers expressed increased concerns over risk and exposure, and the cost of certain goods spiked, such as produce baskets, boxes, crates and packaging. Seed, soil and other amendments were affected in both availability and quality. Impacted supply chains and the partial closing of slaughterhouses forced ranchers to make difficult decisions for their livestock.

The CSU Chico Organic Vegetable Project (OVP) had to temporarily shut down their CSA program when COVID-19 hit. OVP sells to the farmstand, delivers to the College's pantry and dining hall, offers a CSA program and occasionally works with local restaurants. All the vegetables are grown by students which is a great learning opportunity but resulted in disaster when the campus closed due to the pandemic. Manager, Scott Grist, was forced to harvest the entire crop for three months straight, and sales were reduced to only a single buyer, the campus dining hall.

### *Drought*

These hardships have been compounded by the current drought. Failing wells and water district politics have placed ranchers in yet another tough position with limited forage nectar to nourish livestock and bees, respectively. Moreover, drought means increased fire risk for all foothill community producers.

Water is a contentious topic in California, and Butte County, situated at an important hydrologic corridor— the Feather River entering the Sacramento River— is not exempt. The Sustainable Groundwater Management Acts of 2014 (SGMA) has inspired various shifts in how ground and surface water has been managed recently. The state requires the formation of Groundwater Sustainability Agencies (GSAs) which incentivize local agencies to determine their groundwater recharge needs and develop a water sustainability plan, ushering California into a future of statewide groundwater regulation never before done. Given the critical drought conditions experienced this season, the pressure to have some say or responsibility in water management is tremendous.

Fillmore Farms has considered all variables and is transitioning some trees to drip irrigation, while keeping their ditch rights, for now. The situation may change, as models change. Comanche Creek, reliant on groundwater, has planted new rows of persimmons, figs, and kumquat. Could the adjacent ditch for which they have rights help buffer the changing groundwater conditions? Turkey Tail is looking to purchase more holding tanks, as is Noble, and installing new wells was necessary. Paradise Irrigation District is conducting a water options study to assess the installment of a pipeline that would supply their excess Little Butte Creek catchment to other agencies to help offset the lower demand due to wildfire displacement. Resident Paradisians such as Park and District Manager Dan Efseaff are in support of reforming the landscape by purchasing and converting the highest fire risk properties into fire resistant



green spaces.<sup>2</sup> Agriculturists such as Myers and Noble suggest that mixing green open spaces and green belts with agricultural lands, irrigated and prime to buffer water, along with mixed residential zones for worker housing, would increase water use and remove the need for PID to sell water downhill.

Additionally, there are concerns that wells are drying up due to drought pressures. Currently, many reports of dry wells submitted to <https://mydrywell.water.ca.gov/> for the county seem to be coming from agricultural land, as well as residential/mixed properties in Forest Ranch and Cohasset. Turkey Tail installed a second well and ground pool of 2500 gallons. due to the changing climate. The lower ridge communities may be spared for now, but upper elevation groundwater irrigation may decline in favor of surface water, if groundwater is not adequately recharged. . Moreover, the drought is a major concern for farmers who practice dry farming, a no-irrigation crop growing technique that relies on precipitation or a high water table, both of which diminish during drought. The majority of dry farmers remaining in the county are ranchers in the foothills and rolling grasslands, reliant on sufficient soil water to keep grasses and herbs green through early summer. Once the grasslands fade, many will have to move their herd to higher elevations, such as the meadows of Plumas County, or relocate to Oregon or Washington.

Yet Wookey Ranch plans to stay put and make decisions for their herd by observing the living systems they work with day in and out. At 200 acres, Wookey is not exactly a large ranching operation. With some ranchers overseeing 15,000 acres or more, Wookey Ranch may be considered a minor player. However, assessing a farmer's worth by acreage alone is a huge mistake, especially in regards to the management of rangeland. For Wookey, attention to the ecological health of the land is just as important as the management of their herd. Wookey works to "nudge" the balance towards native species. By placing emphasis on native perennial grasses and flowers that serve as edible forage, the ranch remains greener longer, providing more food for livestock, than comparable properties that have allowed the nonnative cheat grass (*Bromus sp.*) or starthistle to flourish. Non-native annual plants dry out the landscape, and dry land causes water to run and erode, as well as increases fire risk. The practices involved with a 'nudge towards native' is more than sourcing or protecting native grassland plants. The careful management of livestock rotations is essential. Livestock are guided to emulate native patterns of deer, elk, turkey, or quail. Lamb, chickens, turkey and pigs are rotated so they get one pass to chew, scratch, peck, or root an area and are moved along frequently to simulate the necessary herd behaviors of not staying too long in one space before predators gather. This allows the grasslands to regenerate and grow back, cycles nutrients, and captures more atmospheric carbon. Similar to popularized ranching like Polyface Farm or Holistic Management taught by Alan Savory, Wookey Ranch incorporates a sense of indigenous respect and understanding for ecology to their work. As for the rain, and how much comes, the selection of new stock, aligning the succession of grasses with calving, and ensuring food is left for young hungry lambs, is all carefully managed. This kind of management promotes water in the soil year round. Ranchers using such practices are ecologists, ranchers, and strategic planners all in one. With this care and attention, as well as direct to community sales at their farmstand and the Chico Certified Farmers Market, Wookey Ranch is well-situated to adapt to the changing climate and economic pressures, and serves as a successful local model for the proper and regenerative use of resources

## *Reaching the Local Market*

The majority of Comanche Creek's CSA, or Community Supported Agriculture, members were displaced by the Camp Fire. This, coupled with the impact of the pandemic, helped encourage the farm to look towards other options for reaching the consumer. At 160 members before the Camp Fire, the CSA program took a 70-80% hit in membership. Concerns arose with the CSA model, including maintaining a member base large enough to make it efficient, increased costs of packaging and labor, and challenges with varieties that can be produced year-round. Another issue is the sheer amount of food an intensive organic farm like Comanche Creek can produce. While it may not seem like a problem to produce a lot, the market is heavily saturated. A 50 acre vegetable farm can provide enough produce for families throughout Chico. Moreover, there are too many producers selling the same products, or unable to get enough traction to establish a specialty market. As a result, Comanche Creek makes only 5% of their sales locally. The other 95% is wholesale, assembled in bulk boxes and destined for Oregon or New York. Regardless, the farm wanted to make local work for them. They bought a storefront near downtown Chico and opened an organic cooperative with partners featured in their box program. Several CSA members opted to pick up their boxes at the store, and many dropped their membership altogether in favor of shopping at the micro-co-op. Another concern Sean had was food waste, and due to the demands of retail, much of the produce with defects is wasted, despite being equally nutritious. At the Comanche Creek store, customers can buy "Perfect Imperfects" at a drastically reduced price and improve access to high quality vegetables that may otherwise have organic, high end prices.

Butte County CSAs all function slightly differently, yet all depend on a local periodic membership intended to float costs so that producers can buy supplies, tools, or hire labor as needed. Grub or Turkey Tail Farm CSA provide solely from their farms, while others like Comanche Creek and Field to Fork Tehama include multiple producers for a single service. Many have box options such as weekly boxes for \$20-40, and although most boxes are selected for members, CSAs sometimes accommodate requests. Conversely, the Co-Op-A-Box program in Oroville has tried a different approach, serving a micro-local 20-mile radius of both producers and members. The project features products from small orchards, organic vegetable farms, herbs and spices, and compost. Members select their box through an online platform featuring an inventory of goods for the week. Members pick up the box at a centrally-located property in Oroville or pay an optional \$5 delivery fee. Grub CSA also employs and is satisfied with the CSA model. Their produce diversity and unusual crop varieties help them stand out among other producers. Grub supplements their income with agritourism, offering a farm-to-table experience, education, and vacation rentals on their 25 acres. The major agritourism opportunity in Butte County is the Sierra Oro Farm Trail, a farm tour program that includes several local farms.

The farmers interviewed expressed differing concerns and market viewpoints depending on the outlets available to them. Any farmer currently vending at the Chico Certified Farmers Market had little concerns about reaching their customers. However, markets have limited space and farmers would be competing with the same products if all farmers participated in the market. Several farmers who could not get into farmers markets locally opted for the farther markets or distributors during peak season. Some farms have turned away from the farmers market model in favor of local grocers, CSAs, or a combination of this. Even cooperatives, which help bring

local products to consumers, become saturated, and larger farms can out-supply smaller farms. Retailers often opt for working with one large supplier rather than several smaller farms due to the ease of handling the logistics and pricing with a single source.

Better control and synchronization of distribution at a local level would be a benefit. Fillmore Farms runs a nut processing center for other organic certified walnut growers in the area. Growers with only a small number of acres can have them processed, packaged, and delivered to local co-ops. This model could be applied with other producers as well and aid grocers and supermarkets in procuring a wide range of Butte County products.

### *Organic Certification*

Despite the ongoing hardships faced by local producers, Fillmore Farms attests that their family walnut orchard is in it for the long haul. Since 1917, the Fillmore property has maintained mature walnut trees with ever shade bearing canopies with an ecologically-minded approach. The Fillmores witnessed the consequences of the agrichemical-led green revolution, a technological transition in global agriculture which completely redesigned farmland management, and in the 1970's, transitioned away from synthetics and insecticides toward organic practices. Fillmore Farms became an early adopter of the organic certification, implementing techniques like cover cropping between rows. To this day, Ryan Fillmore serves on the board for the North Valley Chapter CCOF, a California organic certification program. Due to the continual encouragement of organic practices, strong carbon sequestration, and building of organic matter over 50 years, one can drive machinery over their orchard's tree roots and rows and it still feels soft. Organic for the family means more than just chemical free, it's quality and distinguished land practices which can lead the way towards healthy land. Too often however, the emphasis on quality and sustainability are ignored for the sake of branding and far reach of product. For example, an organic-certified farm may strip topsoil, use excessive mined inputs, use OMRI-certified pesticides that kill pollinators, pump water intensively, hire mass crews at the bare minimum legal wage, and let crops go fallow and rot, damaging soil health and increasing greenhouse gas emissions. Without transparency of contradictory practices, or if retailers and consumers lack other options, a consumer may, despite their good intentions, unintentionally endorse environmentally destructive and exploitative practices. Fillmore Farms believes the organic certification can do better.

Although organic farming is overall a great success through the reduction of environmental toxicity, raising the threshold of quality, encouraging a higher standard and distinction of product, the range of differences between farming practices of those carrying the same certifications can marr the restorative intentions of organic certification and even foster practices counter to that spirit. Without improved standards for distinguishing between practices, such as cover cropping and building soil versus importing potting soil and using a climate-controlled greenhouse, it is hard to identify the quality of restoration, regenerative, and sustainable practices used by each farmer. If a hydroponic farm cannot demonstrate a net benefit of carbon sequestration per tonnage of food produced, for example, then they cannot distinguish themselves to the same ecological standard as a vegetable grower using extensive cover-cropping, composting, and beneficial pollinator rows, or a regenerative rancher carefully managing grassland with livestock, or a walnut farmer keeping the hydrology alive and water table high with careful irrigation and groundcover management. Even flood irrigation has a benefit, according to Fillmore, but only if you understand the dynamics of your soil and it's

capacity to hold water. Differences in soil structure as little as 50 acres away can determine best land management and irrigation practices. Yet there are no recommendations by organic standards to determine best practices for soil types, elevation, precipitation, climate, and so forth. Moreover, the lack of adequate distinction between a regenerative farm and a conventional organic-approved farm can mislead the public on the ethical and environmental benefits of organic certification.

Moreover, the organic certification carries with it a myriad of red tape that forces producers into a burden-of-proof situation if they wish to legitimize the work that many are already doing. For CCOF Organic Certification, for example, an applicant has to provide inspections on good agricultural practices and organic certification standards, an organic systems plan, highlighting all their organic practices and procedures, proof of all the efforts to acquire organic seeds, rootstock or starts for the crops they plan to produce, logs on inputs and methods of cycling nutrients, organic materials, logs on additional cleaning practices of tools and machinery, and demonstrate how your operation cannot be contaminated by pesticide drift or other outside effects. All of these steps are additional tasks a CCOF organic farmer must take that conventional farmers are not required. Moreover, soil building practices like cover-cropping and complex silviculture systems require extra labor input that from an agronomic perspective is traditionally considered separate from food production..

Wookey Ranch, for example, acknowledges that the extra care and attention they put into their ‘nudge to native’ regenerative ranching practices also puts them at a competitive disadvantage to operations which do not consider such factors and can produce more meat at cheaper cost. Compounding a lack of public awareness with the increased costs of producing high quality, ethical meat, one can see how a consumer preference and budget complicates things. As such, farms that incorporate agroecological methods often run at an economic disadvantage and become more dependent on funding, and grants than those who emphasize product quantity over quality. Currently little funding is available for these types of methods. Some offerings include the USDA’s SARE and CDFA’s Healthy Soils, or the Organic Certification Cost-Share. Yet such grants often award participants only after they have invested in and demonstrated successful completion of the projects for which they are requesting aid, requiring substantial upfront costs from the producer.

### *Community Resilience*

Recent events have brought attention to the environmental vulnerability of Butte County, namely wildfire and drought so severe that the Lake Oroville Dam hydroelectric plant had to be shut down for the first time ever. Working closely with the land, many farmers knew what “sustainability” meant well before it became a popular term. However, recent climatic events have put all farmers on alert, as they seek solutions to conserve water, build soil health, and reduce fire danger. The emergence of non-profits The Camp Fire Restoration Project and Regenerating Paradise following the Camp Fire have brought upon a community-wide reimagining of Paradise, Magalia, Concow and Berry Creek from a agrarian, mixed-small-agriculture lens. Various local farms such as Comanche Creek and Grub CSA donated extra produce to shelters and distribution centers. Local food resilience continues with the Vecino Victory Garden, a demonstration permaculture food forest and neighborhood composting center, in Chico, and local seed swaps hosted throughout Butte County.



Sherri Scott, a 25-year nursery veteran and organizer for the Butte County Seed and Scion Swap, sells native, vegetable, herb and medicinal garden starts at the Chico Certified Farmers Market. She also tends to her storefront nursery and works with people to ensure that food cultivars become adapted to Butte County's rich climatic zones. Sherri's vision is of developing locally-adapted seeds and scions, creating a culture of seed saving, carefully selecting cultivars that express the best traits in the local climate and soils they become naturalized to over generations.

### *Looking Forward*

Indeed as the rest of our report shows, there are marginalizing conditions that limit public knowledge of the benefits of ecologically-minded agriculture combining restoration (i.e., sustainability, regeneration/regenerative, agroecology, and permaculture), the value of 'naturalizing' food crops, and more deeply, and indigenous knowledge and stewardship. All farmers identified awareness, education, and enculturation of agroecology and land ethics as potential solutions to address climate change issues within Butte County and to improve community relations with local farmers. These social components narrow the gaps in misunderstanding farm practices (e.g., the belief that rice, walnut, and meat production have an inherently negative environmental impact), and help improve transparency for misleading or harmful practices.

Of the solutions proposed, respect for agricultural labor and promoting a culture of agricultural labor was emphasized. The farmers interviewed expressed concern over the lack of and value of agricultural labor. Either farmers could not afford to hire work at a fair pay, prospective workers lacked appreciation for the value of internship or entry level work, or they struggled to manage increasing costs of labor as living costs skyrocket. Some farmers have been fortunate to have dependable crews with rotational seasonal workers as needed. As mentioned with Ryan Fillmore, immigration may play an important factor in training the next generation of farmers, but also too as other job sectors shift in light of climatic and economic events, formally skilled workers in other job sectors may shift their skill-sets to specialized agricultural fields— if the funding, innovation and cultural push is there. A response to labor and income stressors is to remain adaptive in scale and approach.

### *Conclusion*

Despite the wealth of knowledge obtained, this report has some limitations. This assessment paid special attention to producers in the foothills in order to investigate the impact and transitions that occurred due to environmental and demographic stressors. Future projects should include interviews with larger scale farms, specifically farms that rely on exporting their crops outside of Butte County. Moreover, some prominent farm families, such as Chico Nut and Lundberg, were not available for comment. More information should be obtained from family farms that formed from immigration movements to the county and how these communities support agriculture in Butte County. Additionally, further insight on county-wide policy, decision making, and promotion of agricultural resources could be obtained from an interview with the county Agricultural Commissioner, Louie Mendoza.

This report has demonstrated the incredible potential to heighten food security and resilience in Butte County, regardless of anticipated drier conditions. Residents from different backgrounds, political, economic, and social positions are uniting to conserve resources and ensure sustainability for generations. A significant number of local farmers are invested in agroecological techniques, protecting water, and encouraging a farm culture which acknowledges their work not only in terms of food production but also in land management and stewardship.

## Appendix O

### Environmental Challenges and Resources in Butte County, CA

In addition to the impacts of climate change on food production including its impact on water and crop viability, there are additional environmental challenges that threaten our food security. In this appendix, we have included a non-exhaustive discussion and provided resources for some of the leading concerns, including the decline of soil fertility, decline of pollinators, plastic in the food environment, and pest vulnerability.

#### A. Decline of Soil Fertility

Soil fertility is the ability of the soil to provide nutrients to plants.<sup>1</sup> The fertility of soil is closely linked to the health of the community of microorganisms living within the soil. These microorganisms, largely bacteria, fungi, protozoa, nematodes, & arthropods<sup>2</sup>, use material in the soil and convert it into nutrients the plants can use. Additionally, healthy soil can increase water retention, filter toxins and pollutants, and increase biodiversity. The health of the soil and these microbe communities are critical to plant health and food production.

There is resounding concern over the future of our soils. Widespread agricultural practices like monocropping, herbicide and pesticide use, overgrazing, and dependence on fertilizers are known to deplete nutrients in the soil and decrease the diversity and function of microorganisms.<sup>3,4</sup> This poses a major threat to our food systems and food access. Lower crop yields are not the only concern. Several studies and literature reviews indicate a decline in nutrient content in food grown in the United States.<sup>5,6</sup> Meaning the food we are producing and eating has less nutrients than in the past. It is also noted that farmers select certain genetics for production (size, pest resistance, etc.) not necessarily nutrition density, which can cause nutrient decline.

Currently, there are programs, funding, and incentives to implement regenerative agriculture practices to sustain and improve soil health. Common practices include applying compost, rotational planting, cover cropping, no-till, and restoring habitat within ag land. California and Chico State's Center for Regenerative Agriculture and Resilient Systems are leaders in their work and you can check out their programs and some information on how to support soil health in the links below.

- [Chico State's Center for Regenerative Agriculture and Resilient Systems](#)
- [California's Healthy Soils Program](#)
- [Soil Food Web](#)
- [USDA's Natural Resource Conservation Services - Soil Health, California](#)

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<sup>1</sup>Microorganisms and Soil Fertility, *Bollen, W.*. Oregon State College, 1959

<sup>2</sup> <https://www.soilfoodweb.com.au/about-our-organisation/benefits-of-a-healthy-soil-food-web>

<sup>3</sup> [https://link.springer.com/chapter/10.1007/978-3-319-26777-7\\_8](https://link.springer.com/chapter/10.1007/978-3-319-26777-7_8)

<sup>4</sup> <https://www.sciencedirect.com/science/article/abs/pii/S0929139398001620>

<sup>5</sup> <https://journals.ashs.org/hortsci/view/journals/hortsci/44/1/article-p15.xml>

<sup>6</sup> <https://pubmed.ncbi.nlm.nih.gov/15637215/>

## B. Decline of Pollinators

Pollinators are essential for food production and ecosystem function.<sup>7</sup> According to the California Pollinator Coalition, “globally, pollinators provide service to more than 180,000 different plant species, more than 1,200 crops, and are responsible for producing an estimated one out of every three bites of food.”<sup>8</sup> Furthermore, California is home to more than 1,600 native bees and hundreds of other pollinating insects. The United States Department of Agriculture (USDA) estimates that the crops and products that depend on pollination make up a 15 billion dollar industry. Some of those high value crops like citrus & almonds are grown in California.

There has been a dramatic decline in pollinators all over the world, in California, and Butte County.<sup>9 10 11</sup> The main contributors to pollinator decline include loss of habitat, imported species and diseases, use of pesticides, and climate change.<sup>12</sup> The table below identifies some of the contributors to pollinator decline, the impact that has, and Best Management Practices to protect pollinators and their habitats.

Contributor to Pollinator Decline	Impact	Best Management Practices <sup>13</sup>
<p><i>Habitat loss:</i> Increase in development projects, agriculture use, and roads in wildland and meadow areas.</p>	<ul style="list-style-type: none"> <li>● Loss of breeding sites and food sources</li> <li>● Fragmented habitat that prevents them from properly foraging and finding new breeding sites and food</li> <li>● Decrease in plant biodiversity, decreasing year-round food sources</li> </ul>	<ul style="list-style-type: none"> <li>● Consider impacts of pollinator habitat in planning and development projects</li> <li>● Identify and understand the native pollinators, their habitat, &amp; food in the area</li> <li>● Collect and plant native seeds that are appropriate for the habitat area</li> <li>● Plant hedgerows in agricultural land</li> <li>● Trim, burn and/or clear understory</li> <li>● Promote native plant communities along roadsides</li> <li>● Protect and improve</li> </ul>

<sup>7</sup> <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/technical/ecoscience/bio/?cid=nrcseprd1127207>

<sup>8</sup> <https://www.pollinator.org/california-pollinator-coalition>

<sup>9</sup> National Research Council. 2007. Status of Pollinators in North America. Washington, DC: The National Academies Press. <https://doi.org/10.17226/11761>.

<sup>10</sup> <https://wildlife.ca.gov/Science-Institute/Pollinators>

<sup>11</sup> Interview with Wofchuk Apiaries, Conducted for BCLFA in 2021

<sup>12</sup> <https://www.fws.gov/pollinators/index.html#aa>

<sup>13</sup> [https://www.actahort.org/books/437/437\\_23.htm](https://www.actahort.org/books/437/437_23.htm)



<i>Imported Species/Diseases</i>	<ul style="list-style-type: none"> <li>● Invasives crowd out native plants - reducing food/shelter</li> <li>● Disease causing organisms - including viruses, bacteria, fungi, can transfer from non-native pollinators to native ones</li> </ul>	<p>riparian habitats and resources</p> <ul style="list-style-type: none"> <li>● Understand impacts of pesticide use on pollinators</li> <li>● Reduce or eliminate pesticide use for land management &amp; agriculture, by using regenerative organic farming practices &amp; Indigenous practices of land management</li> </ul>
<i>Use of Pesticides</i>	<ul style="list-style-type: none"> <li>● Pesticide use on crops can harm pollinators and the plants they depend on</li> </ul>	
<i>Climate Change</i>	<ul style="list-style-type: none"> <li>● Change in temperature causes early blooms resulting in pollinators missing out on food and less plants being pollinated</li> </ul>	

For more information on protecting pollinators and their habitats please visit some of these sites:

- [California Department of Food and Agriculture: Pollinator Protection](#)
- [U.S. Fish and Wildlife Services: Pollinators](#)
- [California Department of Pesticide Regulation: Pollinator Protection](#)
- [USDA's Natural Resources Conservation Services, California: Pollinators](#)
- [Xerces Society: Pollinator Conservation Resources for California](#)
- [California Pollinator Association](#)
- [Chico State's Center for Regenerative Agriculture & Resilient Systems: Hedgerows and Pollinator Habitat](#)
- [Traditional Ecological Knowledge Chico](#)

### C. Plastic in the Food Environment

A growing concern is the presence of microplastics in the food environment. A study has recently come out about the amount of microplastics and indicated that the average person may be eating and drinking totals as much as 5 grams of plastic per week.<sup>14</sup> Another research review published in 2019, calculated that the average American eats, drinks, and breathes in more than

<sup>14</sup>

[https://wwf.panda.org/wwf\\_news/press\\_releases/?348337/Revealed-plastic-ingestion-by-people-could-be-equating-to-a-credit-card-a-week](https://wwf.panda.org/wwf_news/press_releases/?348337/Revealed-plastic-ingestion-by-people-could-be-equating-to-a-credit-card-a-week)

74,000 microplastic particles every year.<sup>15</sup> It is known that microplastics are most commonly inhaled but can also be ingested. Furthermore, the most common sources of microplastics are from water, salt, seafood, and beer. Additional means of ingestion include milk, honey, and meats.<sup>16</sup> Some scientists say it's likely that ingesting these tiny bits of plastic could expose us to harmful chemicals.<sup>17</sup> However, this is a recent phenomenon and the full extent of its impact on human and environmental health is not fully understood.

#### D. Pest Vulnerability

Climate changes in carbon dioxide and temperature affect pests' habitat, in some cases making the current environment more suitable for proliferation, in other cases driving insects and fungal varieties toward more hospitable locations. Since 1960, as our globe has slowly risen in temperature, pests and crop diseases have been moving away from the equator toward the northern and southern poles by approximately 2.7 km per year.<sup>18</sup> This global-warming induced pest migration drives pests into new agricultural lands such as the United States. Tar Spot, a fungal infection typical of South America that can lead to yield losses of 11-46%, has been surfacing in more temperate locations in North America. It was first identified in the Midwest in 2015 and has continued to spread through the Corn Belt.<sup>19</sup>

California is not immune to this reality. As an example, the potato psyllid which was minimally seen in California in the 19th century, slowly increased its presence in the 21st century due to warming temperatures. In 2000, California had its first reported year-long infestation with potato psyllid, dramatically impacted tomato, potato, and pepper cultivation.<sup>20</sup>

While more information is needed on the effects of pest migration specific to Butte County, more on pest vulnerability within California and the United States as a whole can be found here:

- [Crop pests and pathogens move polewards in a warming world | Nature Climate Change](#)
- [Tar Spot Disease of Corn Confirmed in Several Nebraska Counties | CropWatch | University of Nebraska–Lincoln \(unl.edu\)](#)
- [Pests and diseases and climate change: Is there a connection? – CIMMYT](#)
- [Climate change will exacerbate California's insect pest problems](#)
- [The Impact of Climate Change on Agricultural Insect Pests \(nih.gov\)](#)

#### E. Conclusion

Agriculture is an industry that revolves around the land, water, and air. Changes to the environment through global warming, pollution, and threats to natural resources have consequences to food production, yields and quality. It is unknown exactly how future events will play out, but it is known that our changing environment is already impacting agriculture, and if not properly managed will have downstream consequences to human health and wellbeing.

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<sup>15</sup> <https://pubs.acs.org/doi/full/10.1021/acs.est.9b01517>

<sup>16</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8473407/>

<sup>17</sup>

<https://www.consumerreports.org/health-wellness/how-to-eat-less-plastic-microplastics-in-food-water-a8899165110/>

<sup>18</sup> <https://www.nature.com/articles/nclimate1990>

<sup>19</sup> <https://cropwatch.unl.edu/2021/tar-spot-disease-corn-confirmed-several-nebraska-counties>

<sup>20</sup> <https://calag.ucanr.edu/Archive/?article=ca.v063n02p73>

## Appendix P

### Agrarian Networks, Associations, and Resources

- Center for Regenerative Agriculture and Resilient Systems: <https://www.csuchico.edu/regenerativeagriculture/>
- Chico Certified Farmers Market: <https://chicofarmersmarket.com/>
- Butte County Local Food Network: <https://bclocalfood.org/>
- Butte Farm Bureau: <http://www.buttefarmbureau.com/>
- California Cooperative Rice Research Foundation: [https://www.crrf.org/ccrrf\\_res\\_1-6-2021\\_002.htm](https://www.crrf.org/ccrrf_res_1-6-2021_002.htm)
- UCCE - 4-H program: [http://cebutte.ucanr.edu/4-H\\_Program/4-H\\_Clubs/](http://cebutte.ucanr.edu/4-H_Program/4-H_Clubs/)
- UCCE - Farm Advisors: [https://cebutte.ucanr.edu/Agriculture\\_Natural\\_Resources/](https://cebutte.ucanr.edu/Agriculture_Natural_Resources/)
- UCCE - Master Gardeners Butte County: <https://ucanr.edu/sites/bcmg/>

## Appendix Q

### Farmers' Markets in Butte County

#### Chico

Chico Certified Farmers Market - Saturday

Saturday 2nd St. & Wall St./Between Flume and Wall (City of Chico Muni Parking Lot #1),  
Chico, 95928

Sat. 7:30am - 1pm, Year Round

(530) 893-3276

managerccfm@gmail.com

Chico Certified Farmers Market - Wednesday Market

Pillsbury Road, Chico, 95926

Wed. 7:30am - 1pm Year Round

(530) 893-3276

managerccfm@gmail.com

Thursday Night Market Downtown, Chico

Broadway & 3rd St., Chico, 95928

Melanie Bassett

Thu 6 - 9pm Apr - Sep

(530) 345-6500

tnm@downtownchico.com

#### Concow

Farmers Marketmobile by Butte County Local Food Network

Canyon Lakes Market (AKA "The Dome Store")

3610 Skycrest Dr., Oroville, CA 95965

Pamm Larry

Saturdays 2-4PM

(530) 570-6872

pamm@bclocalfood.org

#### Gridley

Gridley Farmers Market (*inactive*)

Hazel Street, Gridley, 95948

Lynne Spencer

Sat 9am - noon May - Sep

(530) 846-3142

### **Paradise**

Chico Certified Farmers Market - Paradise, Mondays  
6491 Clark Rd.(Alliance Church Parking Lot), Paradise, 95969  
Mondays 7:30am - noon Jun - Sep  
(530) 893-3276  
managerccfm@gmail.com

Party in the Park Music & Marketplace  
Paradise Community Park, Paradise, 95969  
Monica Nolan  
Thu 5 - 8:30pm June - Aug only  
(530) 877-9356  
monica@paradisechamber.com

### **Oroville**

Chico Certified Farmers Market - Oroville Saturday **(inactive)**  
Meyers St. and Montgomery St., Oroville, 95965  
Monica Szczepanski  
Sat. 7:30am - noon May - Oct  
(530) 893-3276  
managerccfm@gmail.com

Oroville Hospital Farmers Market  
2450 Oro Dam Blvd., Oroville, 95966  
Clarissa Dilbeck  
Wed 9am - 2pm May - Sep  
(530) 532-8004  
[cdilbeck@orohosp.com](mailto:cdilbeck@orohosp.com)

Oroville Saturday Market **(inactive)**  
50 Montgomery St., Oroville, 95966  
Clarissa Dilbeck  
Sat 7-11 am Jun - Oct  
(530) 403-8496  
cdilbeck2@gmail.com

Oroville "Butte Strong" Tuesday Farmers Market **(inactive)**  
Montgomery St. and Meyers St., Oroville, 95966  
Monica Szczepanski  
Tues 4-8 pm May - Oct  
(530) 893-3276  
managerccfm@gmail.com

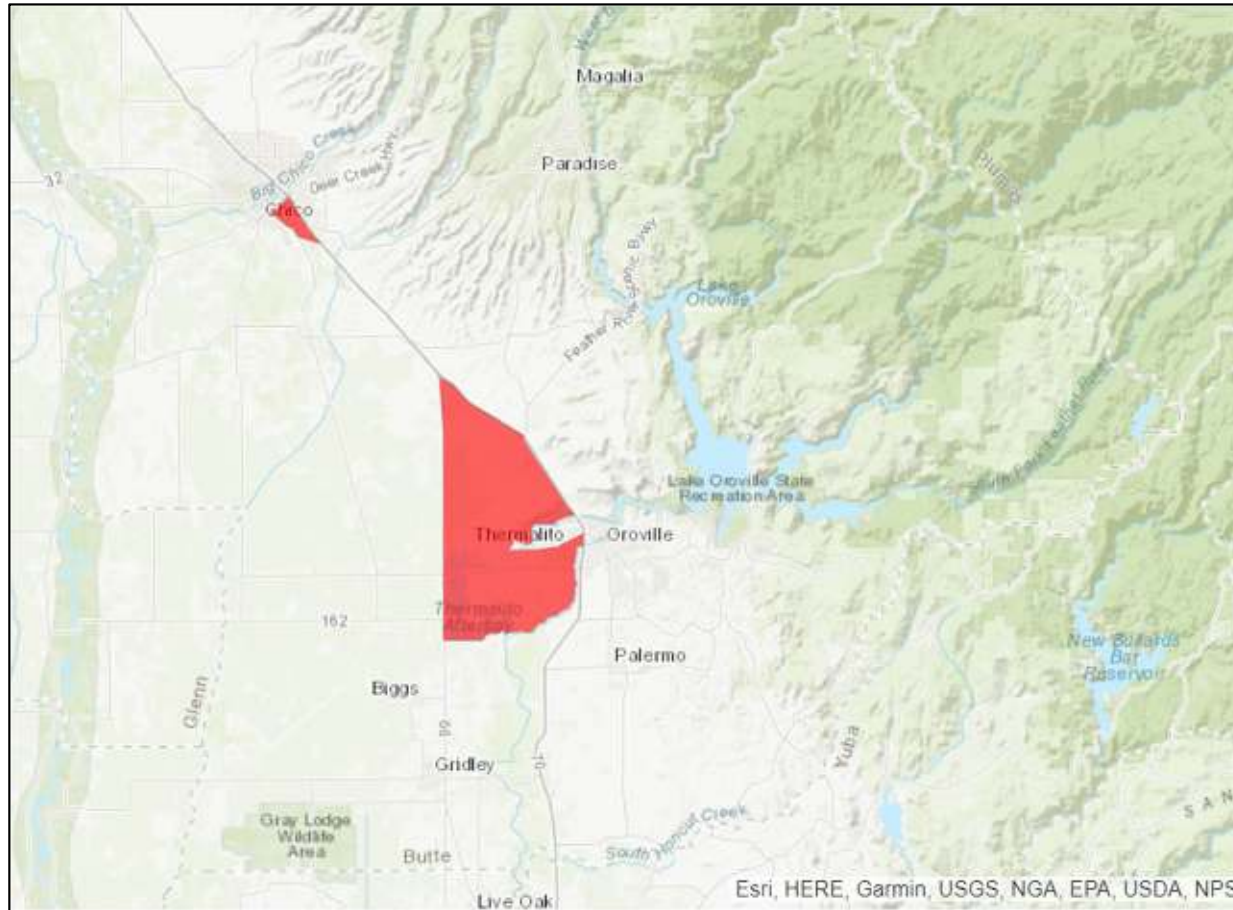


Oroville Saturday Farmers Market  
Montgomery St. & Meyer St., Oroville, 95965  
Nikki Winslow  
Sat 7am - noon May - Sep  
(530) 966-3539  
orovillefarmersmarket@gmail.com

**Magalia**

Farmers Marketmobile by Butte County Local Food Network  
Magalia Community Center, 13917 South Park Dr., Magalia, 95954  
Pamm Larry  
Sundays 10AM to Noon  
(530) 570-6872  
pamm@bclocalfood.org

## Map of Disadvantaged Communities in Butte County



■ Disadvantaged Tracts\*

\*Defined by OEHHA as areas scoring in top 25 percent on the CalEnviroScreen 3.0, which includes measures of environmental and personal health hazards.

**Census Tract: 6007001300**

**Population:** 4,169

**CalEnviroScreen 3.0 Percentile:** 85-90%

**Pollution Burden Percentile:** 89

**Population Characteristics Percentile:** 70

**Ozone:** 61

**PM 2.5:** 41

**Diesel:** 59

**Pesticides:** 78

**Toxic Releases:** 9

**Traffic:** 41

**Drinking Water:** 36

**Cleanups:** 97

**Groundwater Threats:** 94

**Hazardous Waste:** 97

**Impaired Water:** 41

**Solid Waste:** 83

**Asthma:** 47

**Low Birth Weight:** 29

**Cardiovascular Disease:** 50

**Education:** 77

**Linguistic Isolation:** 56

**Poverty:** 95

**Unemployment:** 97

**Housing Burden:** 95

**Census Tract: 6007003700**

**Population:** 4,505

**CalEnviroScreen 3.0 Percentile:** 80-85%

**Pollution Burden Percentile:** 51

**Population Characteristics Percentile:** 93

**Ozone:** 69

**PM 2.5:** 33

**Diesel:** 8

**Pesticides:** 72

**Toxic Releases:** 2

**Traffic:** 16

**Drinking Water:** 61

**Cleanups:** 43

**Groundwater Threats:** 69

**Hazardous Waste:** 43

**Impaired Water:** 76

**Solid Waste:** 34

**Asthma:** 89

**Low Birth Weight:** 97

**Cardiovascular Disease:** 99

**Education:** 69

**Linguistic Isolation:** 42

**Poverty:** 86

**Unemployment:** 98

**Housing Burden:** 28

## Appendix S

### Food Disaster Preparedness

#### Introduction

Butte County has experienced four high impact disasters recently: the Camp Fire (November 2018), the North Complex Fire (August 2020), the COVID-19 pandemic (March 2020 and ongoing), and the Oroville Dam Disaster (February 2017), which was caused by damaged spillways and nearly collapsed the concrete weir, resulting in the evacuation of 180,000 people. While each was devastating, the Camp Fire and COVID-19 pandemic were so severe and vast in their scope that their impact has had both immediate and long-lasting effects to the residents of Butte County, forcing many into lives of houselessness, increasing food insecurity, and harming food system production and distribution. In each of these disasters, the county relied on a disaster relief system that originates at the federal level then trickles down to the state, county, and individual municipality levels.

The disaster relief plans operate under a set of assumptions outlined below:

1. Communication systems both locally and nationally will remain intact
2. Outside entities (e.g., Red Cross, FEMA, CalOES) will step in with the authority and means to bring aid to the community
3. Energy systems remain in place
4. Government agencies will remain in place
5. Civil peace will prevail (as opposed to unrest) and the law will be enforceable
6. Transportation systems will remain intact
7. Incidents will be relatively short term
8. Food in abundance from another part of the country will be shipped into the area of need or will be imported internationally

These assumptions beg the question of what would happen if the system fails. What if lines of communication or transportation are impeded, or the crisis lasts longer than federal aid can accommodate? The reality is that Butte County, along with most counties in the nation, have no plan for these scenarios as they are considered “unthinkables.”

Federal, state and local agencies prepare for the following potential disruptions in the food system which are relatively regionalized and short term: food contamination and disruption (accidental or intentional), supply chain disruption, crop disease and pests, and acute natural disasters.

In addition to the aforementioned disasters that have already occurred in Butte County, agencies such as FEMA, DHS, CISA, and DOD less openly discuss plans for more catastrophic, low potential, but high impact events that could affect agriculture and food security for a much longer time, such as nuclear war, cyberterrorism, EMP attacks, solar or geomagnetic storms, and collapse of the national or regional grid, all of which are described at the end of this Appendix. Although less likely to occur, their impact would undermine all assumptions currently made about disaster relief. For example, collapse of the national grid or regional portion of the grid would disrupt communication within the affected area, impairing receipt and coordination of aid. Loss of electricity would impact all sectors of the food and water system. Moreover, the grid could take months to years to repair, resulting in prolonged food scarcity and insecurity. One

analysis, conducted by the Commission to Assess the Threat to the United States, estimates that national grid failure could result in the deaths of up to 90% of the population within a year, primarily due to challenges with medical, food, and water supply.<sup>1</sup>

Such disasters, ranging from small to catastrophic, point to the need for a comprehensive food disaster relief plan at the local level, along with the necessary supplies and infrastructure to execute the plan. It should be noted that the food system is complex and involves multiple industries that are mutually dependent upon each other, so if one part of the system fails, the entire system suffers. Additionally, food, by nature, is time-sensitive. Much of the food supply is perishable, and food is considered an immediate, basic need for all, making the coordination of feeding people during a disaster of prime importance. Thus, the time-sensitive nature of food means that interruptions to the food system will have immediate consequences. Generally, multiple agencies must coordinate to provide food to those in need, and the logistics are challenging due to food safety and processing regulation. Meeting nutritional needs during a disaster requires extensive planning and should not be considered an afterthought.

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## **The Current Disaster Relief Model and Governmental Plans**

The Disaster Relief model in the United States is built on a plan that starts at the federal level via the Department of Homeland Security (DHS), Federally Emergency Management Agency (FEMA), and other agencies. Food and agriculture is considered essential infrastructure, and its portion of the federal plan is overseen by the USDA, FDA, Cybersecurity and Infrastructure Security Agency (CISA), EPA, a number of other agencies, private entities, and businesses.

The next level of coordination is via the California Office Of Emergency Services (Cal OES), which is charged with creating the state plan to coordinate with the counties and municipalities. The food part of this plan is managed by the California Department of Food and Agriculture, State of California Emergency Management Agency (Cal-EMA), California Animal Response Emergency System (CARES), Department of Resources Recycling and Recovery, Cal EPA, and other agencies as needed.

Under the state level is the county level, which has developed a disaster plan not only within its boundaries but also in coordination with our Mutual Aid Region of 13 counties in the Northeastern part of the state. This mutual aid coordination working group meets quarterly and primarily includes fire or flood and rescue and focuses on keeping the peace and coordination of emergency shelter and medical care. Please note the following language extracted from the County General Disaster Plan<sup>2</sup>:

*"It may be necessary to make difficult choices among competing requests for the same resource [italic added]. To assure that the status of resource requests and commitments can be maintained throughout the emergency, the Logistics and Planning Sections of the Emergency Operation Center (EOC) staff will expeditiously locate and track resources of the County.*

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<sup>1</sup> <http://www.empcommission.org/>

<sup>2</sup> [Butte County Operational Area](#)



When activated, the Butte County EOC establishes priorities for resource allocation during the emergency. *All county resources are considered part of a pool* [italic added] which may be allocated by the County EOC to fulfill priority missions. Each department retains control of its non-assigned resources until released for an emergency assignment by the EOC.”

The Butte County Plan includes agriculture in Functional Annex I: Critical Infrastructure and Key Resources. Agriculture is defined as “the sources of network that support food supply production including commercial farming, livestock and holding facilities.” In the event of a disaster, the county is charged with protection of critical infrastructure and is required to have a plan that addresses the following:

- How to respond to a service disruption
- How to provide backup service both to responders and the public at large to guarantee minimum levels of health and safety
- How to reestablish service in a timely and safe manner;
- Identify the requirements for additional security protection.

Note that this definition includes food production but does not include distribution to residents. As with the federal and state governments, the county can appropriate food into its pool and allocate the resource as it deems necessary, but not legally obligated to provide food for the population.

## **Current Conditions**

Butte County has no stockpile of food to accommodate an emergency. Some private and nonprofit organizations have, or are establishing, their own reserves, such as Bishops’ Storehouse and Our Father’s House. The North Valley Food Bank is currently developing a food disaster plan. However, Butte County governmental agencies are not prepared with food stores nor a functional food distribution plan.

CalOES was contacted for this report with a request for information on state food reserves for the public; however, they discontinued communication after asking who would have access to the information; therefore, it is unknown whether the state has any stores or not.

The Federal government moved food out of the Strategic National Stockpile system in the 1990s and allocated that responsibility to FEMA. There is no public data available on FEMA food reserves.

Private documents from an individual in FEMA Sector 8 reveal that FEMA, DHS, and the military are currently preparing for all of these possibilities. Alarmingly, all the documents directly or indirectly convey that in the event of a catastrophic event, at this point in time, residents are essentially on their own. The plans and documents state that all levels of government, outside local, will be overwhelmed with their tasks of protecting infrastructure, protecting borders, preserving power of the current administration, and maintaining civil peace and order.

## **Opportunities**

Coordination amongst local agencies combined with an advanced and supported public education campaign would do much to soften or mitigate some of the more catastrophic impacts on the food supply that can occur in the event of a major food disaster.

The focus groups assessed for this report revealed a high level of expertise in food system management available in the local community. Participants shared a community-wide interest in improving infrastructure and developing a coordinated plan for food security in Butte County. Will and expertise exist; however, resources and support needed to execute such a plan need development.

A couple other California Counties have created feeding plans in the event of a major food supply crisis. Both Santa Barbara<sup>3</sup> and San Diego<sup>4</sup> counties have developed a Multi-Agency Disaster Feeding Plan and Feeding Task Force which address short-term feeding plans, but still rely heavily on the input of food from outside agencies. Likewise, it is understood that Sierra and Plumas counties are currently developing their own food relief plans.

Given the increased incidence of unthinkable events in the area, Butte County, perhaps more than most counties, should have the capacity to imagine the possibility and devastation of food system collapse. Proper preparation for food shortages and for the unfortunate event that food may not be adequately provided from outside the county is a major benefit to the safety, health, and resilience of the county.

Although the federal government, as Butte County has experienced, has an effective emergency relief plan for short-term or isolated events, given the continued and escalating severity of disasters here and throughout the nation, it would behoove the county to develop its own disaster feeding plan or, at minimum, start a conversation on the topic. A template with guidance and best practices for a Multi-Agency Disaster Feeding Plan is provided by National Mass Care Strategy.<sup>5</sup>

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## Potential Disasters Impacting the Food System

### Nuclear War

While unlikely to occur, nuclear war remains a serious life-altering threat to global security. Researchers interested in the impact of nuclear war on the food system modeled the effect of a localized conflict between India and Pakistan. Such an event would result in widespread fires, polluting an estimated 5 Tg of soot into the stratosphere. The result is severe climate perturbations including global cooling about approximately 1.8°C, 8% reduction in precipitation, and increased solar radiation. Crop models assessed at 5 and 10

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<sup>3</sup>

<https://foodbanksbc.org/wp-content/uploads/2020/03/Multi-Agency-Disaster-Feeding-Plan-Santa-Barbara-Co-FINAL-Nov-2019.pdf>

<sup>4</sup>

[https://www.sandiegocounty.gov/content/dam/sdc/oes/emergency\\_management/plans/op-area-plan/2018/2018-EOP-Basic-Plan.pdf](https://www.sandiegocounty.gov/content/dam/sdc/oes/emergency_management/plans/op-area-plan/2018/2018-EOP-Basic-Plan.pdf)

<sup>5</sup> <https://nationalmasscarestrategy.org/new-release-multi-agency-feeding-support-plan-template/>

year intervals indicate significant and long-lasting devastation to the global agricultural system, driven primarily by the cooler temperatures. While reserves and trade could help buffer the impact for the first year, by year five, maize production is estimated to drop by 13% and soybean production is estimated to drop by 17%, staples for sources in most counties.<sup>6</sup> The result is widespread food insecurity.

#### Cyberterrorist attacks on the internet

Recent years have seen an increase in cyberattacks globally and domestically. See Appendix for a list of significant cyber incidents dating back to 2006.<sup>7</sup> Notably, JBS, the world's largest meat producer, suffered a ransomware attack on May 30, 2021 that shut down operations in Australia, Canada, and the United States. Governments are sounding the alarm of increased cyber attacks on food and water systems in 2021 and now consider them a matter of National Security.<sup>8</sup> The World Economic Forum rates Cyberattacks on critical infrastructure 5th on their list of top security risks impacting the world's economic and domestic stability.<sup>9</sup> Given the integrated nature of the food system, attacks not just on agriculture, but on other critical sectors, such as transportation or energy, would have immediate implications for food availability and production.

#### Collapse of the National or Regional Grid

The electrical power grid is essential infrastructure. Collapse either nationally or regionally would immediately disrupt all industries, including food production, transportation, and communications. Although the Department of Homeland Security (DHS) and the other branches of the National Security State consider these potential disasters, until recently, they all worked independently without a unified front. Government documents indicate that, given the pertinence of other issues facing the world, the low likelihood of grid collapse outweighs any extensive re-directing of resources from issues deemed more important in the short term.

However, in March 2019, President Trump signed Executive Order 13865, charging DHS in coordination with other agencies to assess the threats, identify critical infrastructure, mitigate risk, and determine best practices for national resilience. DHS has since released the Electromagnetic Pulse (EMP) Program Status Report<sup>10</sup> which identifies vulnerabilities and reviews preparedness plans. Moreover, FEMA is scheduled to conduct an interagency EMP exercise sometime during 2021, in addition to their regularly scheduled biennial National Level Exercise.<sup>11</sup>

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<sup>6</sup> <https://www.pnas.org/content/117/13/7071>

<sup>7</sup> [211105\\_SignificantCyberIncidents.pdf \(csis-website-prod.s3.amazonaws.com\)](https://www.csis.org/website-prod.s3.amazonaws.com/211105_SignificantCyberIncidents.pdf)

<sup>8</sup>

<https://www.cisa.gov/news/2021/10/18/cisa-fbi-and-nsa-release-blackmatter-ransomware-advisory-help-or-organizations-reduce>

<sup>9</sup> <https://reports.weforum.org/global-risks-report-2020/wild-wide-web/>

<sup>10</sup> [https://www.cisa.gov/sites/default/files/publications/emp-program-status-report\\_508.pdf](https://www.cisa.gov/sites/default/files/publications/emp-program-status-report_508.pdf)

<sup>11</sup> <https://www.fema.gov/emergency-managers/national-preparedness/exercises/national-level-exercise#>

## Electromagnetic Pulse (EMP) Event

The primary threat to the power grid is an electromagnetic pulse (EMP). An EMP is a burst of electromagnetic energy with potential to damage technology systems and critical infrastructure. EMPs can be naturally occurring or purposely induced. Causes of naturally occurring EMPs include solar flares and coronal mass ejections (CMEs), both of which can lead to geomagnetic storms. Radiation or charged particles interact with Earth's atmosphere and magnetic field inducing an electric current in the magnetosphere and on the ground.<sup>12</sup> While CMEs can take days to reach Earth, the radiation from solar flares reaches Earth in only 8 minutes.<sup>13</sup> Typically these events are small and occur with minimal consequence. However, when the solar activity is strong enough, it can result in EMPs large enough to destroy electrical infrastructure on a massive scale. The literature mentions major solar events hitting the Earth in 1847, 1859, 1872, 1909, 1921, 1960, 1972, 1982, 1989, and 2003. The event of 1859, dubbed the Carrington Event, was strong enough to disrupt the newly invented telegraph. Such an event would have crippling implications today due to the sheer vastness of current technology systems and our reliance on them. The more recent Quebec Blackout of 1989 serves as a warning of what could happen if a larger solar event was to occur today.<sup>14</sup> Unsettlingly, scientists admit there is little capacity to predict solar storms, and estimates for a Carrington-level events could occur anywhere from once in every 150 years<sup>15</sup> to once in every 500 years.<sup>16</sup>

Man-made sources of EMPs large enough to damage power and technology systems can occur as a result of a Nuclear EMP attack. A nuclear EMP attack is caused by the detonation of a nuclear weapon at high altitude. Unlike a traditional nuclear bomb, an EMP attack would be targeted toward electrical systems specifically without directly taking lives. However, such an attack would nonetheless have devastating consequences to critical systems, jeopardizing the stability, access to resources, and safety of the affected area.<sup>17</sup>

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<sup>12</sup> <https://www.swpc.noaa.gov/phenomena/geomagnetic-storms>

<sup>13</sup> <https://www.nasa.gov/content/goddard/the-difference-between-flares-and-cmes>

<sup>14</sup> [https://www.nasa.gov/topics/earth/features/sun\\_darkness.html](https://www.nasa.gov/topics/earth/features/sun_darkness.html)

<sup>15</sup>

<https://www.lloyds.com/~media/lloyds/reports/emerging-risk-reports/solar-storm-risk-to-the-north-american-electric-grid.pdf>

<sup>16</sup> <https://www.dhs.gov/xlibrary/assets/rma-geomagnetic-storms.pdf>

<sup>17</sup> [http://www.empcommission.org/docs/empc\\_exec\\_rpt.pdf](http://www.empcommission.org/docs/empc_exec_rpt.pdf)

## Appendix T

### Food Pantries and Free Meals Serving Butte County

This is not a comprehensive list of all food pantries, but does include those discovered from the team's research. The pantries are listed below, with the most recent information (August 31, 2021). The status of these pantries may change, particularly the location and date/time of distribution.

**Food Suppliers to these groups** include: Feeding America - Food Bank of Contra Costa County, Bimbo Bakery, Gleaners, Holiday Food Market, SaveMart, Oroville - North State Food Bank, Yuba City Food Bank, USDA - Farm to Families Program - CityServe distributes, CSU Chico Organic Vegetable Project. Other local businesses and individuals donate food too.

#### County-Wide

- **North State Food Bank:** Ongoing Food Distribution Center Calendar via Community Action Agency's Food Bank  
<https://www.buttecaa.com/wp-content/uploads/2022/01/TEFAP-Distribution-Schedule-2022.pdf>
- **Passages** - Full Meals for seniors  
530-898-4224 <https://www.passagescenter.org/information-assistance/senior-nutrition/>  
Chico, Oroville, Gridley  
Meals – 2018-2021                      373,291                      Clients 2,672  
They serve 165 seniors per week 825 meals per week. Suggested donation is requested but not required. Deputy Director oversees data and nutrition program. No local food used. No routes to the outlying areas in any of our counties. They went from serving congregate hot lunches in various senior center locales to delivering 5 frozen meals to their clients homes.

#### Chico

- Meals on Wheels Chico, Full Meals, <https://www.chicomealsonwheels.org/>
- Food Pantries
  - **The Bishop's Storehouse**, located in Chico, is operated by the Church of Jesus Christ of Latter-Day Saints (LDS). This food pantry primarily serves its church members in Northern California (Yuba City to Mount Shasta), who need food items and other household supplies like toothpaste, hygiene, and general supplies you might typically find in a grocery store. During non-emergency times, they serve about 300 households per month. Participants must be referred for services by an ecclesiastical church leader like a Relief Society President or a Bishop. They help identify the food needs and authorize the food orders. Persons who are not members of the church may also receive assistance, on a case-by-case basis. For example, they provided, and still provide, food orders for Camp Fire survivors. For large food needs, they will distribute supplies through other non-profits such as local food banks like the Magalia Community Church, and distribution sites via Chico State's Wildcat Food Pantry and Butte College Roadrunner Hub. Such distributions since the Camp Fire have been in the several millions of dollars.



- **Chico State's Hungry Wildcat Food Pantry**  
<https://www.csuchico.edu/basic-needs/pantry.shtml> offers student friendly, healthy, local, and shelf stable food for Chico State students. They also provide assistance in applying for CalFresh benefits. They distribute approximately 50 tons per academic year, serving over 4,000 students.
- **Caring Choices** - service providers with pantry, M-F 8 am - 5 pm, 866-703-3873  
<http://www.caring-choices.org/food-pantry-.html>
- **Catholic Ladies Relief Society #3 in Chico**  
 Their pantry is non-perishables, mostly delivering to other providers now, such as low-income seniors housing at Jarvis Gardens and Campbell Commons, and up to Paradise and 1st Baptist, Concow, and Torres Shelter, Hunger Trolley and Comanche Creek. Food source is Blue Bags, and they receive about 8,000 lbs every other month, but it has been as high as 11,000-13,000 lbs. They do buy fruit and jams/jellies.
- **Chico Rescue Mission** - Drug/alcohol treatment program for Homeless men only. Provide currently 40 men 3 meals/day (could go up to 60-70 men capacity, smaller now due to mostly to Covid.)  
 Every Tuesday they also provide a large box of food to anyone who walks up; 10-40 people/week - mostly bread and pastries and a few non perishables.
- **Chico Gleaners** - "The program is open to seniors 50-years and older for a fee of \$50 a month plus, if they are physically capable, two hours of volunteering a month. Members pick up food for themselves and their household once a week.  
 "For \$12.50 a week they get fresh produce, dairy products, meat, pastries, bread, eggs, canned and dry goods," said Lloyd Watson, president.  
 On pick-up days Watson and his team set up the warehouse so that members can walk one-through shopping for the items they want."  
<https://www.chicoer.com/2020/10/25/coronavirus-causes-declining-membership-in-chico-gleaners/>
- **Chico Everhart Village:** Expects to provide tiny homes for 20 mentally ill referrals by the end of the year. They "do not plan to serve meals to the Village, one of our goals is to meal prep and meal plan with them utilizing donated food."
- **Chico Food Project (Blue Bag):** The Chico Food Project is a fun and simple way to share food with the hungry in our community. We come to your doorstep 6 times per year to pick up your blue bag filled with non-perishables and leave you an empty bag for the next pickup. We are over 1,000 members strong and we collect over 11,000 lbs. of food at each pickup. The food is given to the Chico Food Locker, the Jesus Center, the Salvation Army, Vectors For Veterans, St. Vincent De Paul and CSUC Hungry Wildcats.  
<http://www.chicofoodproject.org/>
- **Chico Food Locker:** Catholic Ladies Relief Society:  
[https://m.facebook.com/Catholic-Ladies-Relief-Society-3-1681359945507214/?\\_rdr](https://m.facebook.com/Catholic-Ladies-Relief-Society-3-1681359945507214/?_rdr)
- **Chico Gleaners** - "The program is open to seniors 50-years and older for a fee of \$50 a month plus, if they are physically capable, two hours of volunteering a month. Members pick up food for themselves and their household once a week.  
 "For \$12.50 a week they get fresh produce, dairy products, meat, pastries, bread, eggs, canned and dry goods," said Lloyd Watson, president.  
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<https://www.chicoer.com/2020/10/25/coronavirus-causes-declining-membership-in-chico-gleaners/>

- **Chico Vets** (Vietnam Veterans Butte County Chapter 582) Veterans' Food Pantry, Sunday at 10 am, Chico Veterans' Hall
- **Vectors for Veterans:** <https://www.vectorschico.com/>
- **Chico Volunteer Groups** - all donated food from individuals and some, as 501(c)(3) nonprofits, get some grant money. Right now the city has closed the Plaza for the second time this year, ostensibly for repairs, and people are sleeping on the sidewalks outside the fencing. The volunteer groups move their services across the street to outside the city council chambers. Because of this inconstant funding stream, there are often gaps, for example if one core person goes on vacation or burns out, the meals may get skipped. Right now there is no one providing food on Thursdays. Often the available grant money has narrow applications, such as only for Covid-related purposes, or just for fire survivors. As with all grants, when that funding ends, the resulting program may end too, which is why so many volunteers just self-fund. Several groups use GoFundMe or similar applications for donations to purchase food and survival necessities. Many churches have their own member-supported food programs, some receive some food pantry help. This is not seen as sustainable. People are exhausted from crisis upon crisis. Some, like CFOTS, do not want to apply for 501(c)(3) because of the administrative and required paperwork and tax forms make it unappealing to them.
  - Chico Friends on the Streets (CFOTS) - Spends about \$200/week and now makes 175 sandwiches, One woman plus helpers make and distribute to Chico Plaza for homeless CFOTS, Comanche Creek, and Teichert Ponds every Sunday, and distributes 60 gallons of water at least weekly to the same locations. Over 100F they do more water deliveries midweek. They also average 25-30 breakfasts M-W-Fri from 9-10am at the Chico downtown Plaza for the past 6 months since the JC stopped serving meals March 31, 2021. Sundays at Noon-1pm feed about 50 meals plus essential needs products, for the past 6 years. All volunteers.
  -
- South Chico Community Assistance Center: SCCAC works within the community to alleviate hunger, advocate for environmental, economic, and social justice, and provide referral services. They promote the health, well-being, and dignity of everyone living in the community regardless of income or housing status by providing free healthy food, clothing, blankets, and sanitary/hygiene products; free meeting space for community organizing and other events, and referral services.
- Faith Lutheran Church - Receives Contra Costa/Solano Food - offers drive through pick up for 145 families in July; 170 families in August. 10am-Noon 1st & 3rd Fridays/month. Faith Lutheran Church Parking lot at 667 E First Ave, Chico. There are no qualifications to receive food. Open to everyone. We only track the following information: Have you been impacted by fire? Have you suffered a loss of income or otherwise been impacted by Covid 19?
- Chico DSA/People's Assembly- provides 25 meals on Tuesday evenings at 6pm in Chico Downtown Plaza. All volunteers. Fundraises for food, supplies, etc. Calendar: [https://chicodsa.org/events?fbclid=IwAR0VvleeWRoI00fh04LdsH5Sa9AAEDkB3S\\_g1LR-EIQOcqP6GIXNSehdo-A](https://chicodsa.org/events?fbclid=IwAR0VvleeWRoI00fh04LdsH5Sa9AAEDkB3S_g1LR-EIQOcqP6GIXNSehdo-A)
- Hunger Trolley - Chico - 36 meals Friday evenings plus 36 Breakfast bags, usually downtown Plaza. Now an LLC, they have applied for 501(c)(3) status so they can apply for grants. All volunteers. They "made and delivered 847 hot meals and 607 breakfast bags -- TOTALING 1,454 meals since February 12, 2021 to Sept 4, 2021."

## Oroville

- Feather River Senior Citizens' Association (FRSCA), Full meals, 1335 Myers St., Oroville, CA 95965, 530-533-8370, <https://www.facebook.com/FeatherRiverSeniorCitizensAssociation/>
- Food Pantries
  - **Butte College's Roadrunner Hub** is [a resource center](#) for Butte College students providing food pantry services. They also provide assistance in applying for CalFresh benefits
  - **Gleaners:**
  - **Oroville Hope Center:** The Hope Center has moved its operations from Kitrick Avenue downtown to a 40,000-square-foot warehouse on South 5th Avenue. Their food pantry is open Tuesdays through Thursdays from 8:30am-3pm. They used to make hot meals 1x/day pre Covid, but went to food boxes and served about 330 families per month. June was 150 individuals. Besides the Community Action boxes, they have a food bank of their own and give 75-100 food boxes a month from there + any walk-ins and/or emergencies - no one is turned away. They are now doing sack lunches Tuesday-Friday, which used to be hot meals. For the future they are constructing a commercial kitchen and dining room and will be able to serve 1 hot meal on site.
  - **Oroville Rescue Mission**  
For their in-house residents, they provide all meals. For their food pantry FOOD BOX DISTRIBUTION: Monday - Friday 1:00-3.00 P.M. Tuesdays & Thursdays 10:00 A.M Surplus Bread and food distribution.  
Recipients Please Bring:
    1. Current proof of residence. (utility bill, official piece of mail, or an imprinted receipt.)
    2. Current proof of income(paycheck stubs, passport to services or SSI award letter.)
    3. Medi-cal cards, birth certificates or picture I.D for each family member.
- French Family Food Bank (Our Father's House):
  -

## Paradise/Magalia

In many ways, this is a success model community, because they are not siloed, they are a collection of interfaith and other community groups, who meet once a month and share data, plans and resources. They are a group of mostly churches on the burn scar in Paradise and Magalia. They received food from USDA and FEMA, which stopped in May 2021, 1200 boxes; and also they receive some food from private donors via Green/Blue Bags and Contra Costa Food Bank.

- Full meals: None found since the Cmp Fire
- **Feeding the Ridge:** A group of mostly churches on the burn scar in Paradise and Magalia. They receive and distribute food on the Ridge and collaborate to best utilize resources.  
Contact: Aaron Singer, [aaronsinger@paradisestronger.org](mailto:aaronsinger@paradisestronger.org)
- **Adventist Church - Paradise** Distributes food as they obtain it. Works with Feeding The Ridge. Gives about 80 people 1-2 bags of food/mo. Program started March 2020, receives 100 boxes per week, and distributes them to other churches. Jan 2021 - gave away 95 boxes themselves, Monday 10 am - 2pm
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- **Paradise Strong Paradise Strong** picks up about 250 bags from Green/Blue Bags once per month for pantries and plans to deliver some to homes by volunteer drivers for people with transportation issues. They are planning a garden for the spring of 2022 which will be a teaching garden and they will use produce to cook community meals together.
- **Magalia Community Church**  
3rd week of month - all food received via Blue Bags/food banks goes to Paradise & Magalia  
Last week of the month, food goes to all of Butte County.  
Each gets their own box - 1 box for 2 people (2 boxes for a family of 4, 3 for 7 etc.)  
Most boxes contain enough food for a week: canned fruits and veggies, rice or flour  
Some churches put the extra food - unboxed - on their pantry shelves.  
Magalia lets folks walk through the pantry and refrigerator and pick what they want now.  
Magalia feeds 300-400 families/monthly who have signed up, about 800 individuals.
- **First Christian Church, Paradise** Saturdays 11-1, Sundays 12-2, Feeds About 150 Families/week. Their system allows a woman from Stirling City to come Sundays after the church group shops and takes all the leftovers and delivers them to residents there on a regular delivery list.
- **Hope Center - Paradise** Pantry Open Tues-Fri 10am-Noon and 1-3pm, serves about 400 households per month. Now has boxes set aside just for Dixie Fire evacuees. "In 2018 the Hope Center served 42,184 clients including Camp Fire survivors. In 2020 43,294 people in need took advantage of the center's services. This year to date, the center has served 16,017 clients."  
<https://www.chicoer.com/2021/09/09/hope-center-founders-leaving-oroville/>
- **Paradise Gleaners** 1245 Oroville Dam Blvd. #10 Oroville, CA Who: anyone who needs groceries When: Tuesdays & Thursdays 10am-2pm Contact: (530) 815-5489 (*Note: The Paradise Gleaners relocated to Oroville due to the Camp Fire*).
- **Paradise CMA Church** 6491 Clark Road, Paradise (530) 877-7069 Hours: Dinner Thursdays from 5pm till they run out of food
- **First Baptist**

**Bear Creek** Fires victims held their first year anniversary with the pre-opening of their new Long Term Bear Fire Recovery Group Resource Center which is managed by California Hope for Northern Valley Catholic Social Services. "In addition to food, emergency preparedness kits, new socks, hand sanitizer, gas cards were also being distributed. Survivors could also speak to crisis counselors and each other support resource people during the event."

<https://www.chicoer.com/2021/09/10/center-opens-to-aid-bear-fire-survivors/>

**Food Distributed by Organization**  
Paradise

1st Christian Paradise	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	Started in Sep	Housed in First Christian Church in Chico							362	429	419	370
2020	535	530	763	817	811	723	480 Moved back Paradise	1031	824	849	688	594
2021	1,101	1,019	747	560	697	346 walk in pantry	525					

1st Baptist Paradise		Days Pantry Open	People Served	Camp fire survivors	Veterans	Partial Year
Part of Feeding The Ridge	2021	29	1,377	1,334	342	Jan - Jul
	2020	63	17,027	16,823	604	
	2019	107	13,117	1,2179	318	Apr-Dec



## CHICO

- **Caring Choices - service providers with pantry - Total number of clients: 376**

Caring Choices 2020	July - Dec	Wildfire survivors	Homeless
Clients served	90	37 (41%)	Not counted

Caring Choices 2021	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Clients served	80	147	139	105	141	196	237	379
Homeless					51	165 47%	203 54%	260 57%
Wildfire Survivor					60 21%	72 21%	91 24%	107 24%

Caring Choices continues to report their data. Total Served in September: 487

Wildfire Survivors: 144 (31%)

Homeless: 271 (59%)

- **Catholic Ladies Relief Society #3 in Chico**

Catholic Ladies	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
2021 # people served	262	295	265	217	215	279	327	

## OROVILLE

### Oroville Rescue Mission

Month 2021	People served	Meals Provided
June	4825	5069
July	4319	4405
August	5504	5817
<b>Total Average</b>	<b>4883</b>	<b>5097</b>

1st Baptist Paradise		Days Pantry Open	People Served	Camp fire survivors	Veterans	Partial Year
Part of Feeding The Ridge	2021	29	1,377	1,334	342	Jan - Jul
	2020	63	17,027	16,823	604	
	2019	107	13,117	1,2179	318	Apr-Dec

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