El Dorado County West Slope Agricultural Development Feasibility Assessment

WRDMP Agricultural Advisory Group Grower Interview Summary and Project Update Meeting

10:00 a.m. to 12:00 p.m.
May 21, 2019
Placerville, CA

Meeting Topics & Desired Outcomes

- Grower Interview Summary
  - Review grower interview feedback
- EDC Economic Analysis
  - Review major EDC crops and markets
  - Review economic analysis approach
  - Receive AAG input on revised crop and market definitions
- Land Suitability Analysis
  - Review crop factor analysis
  - Receive AAG input on crop factor analysis

Grower Interview Summary

Grower Interviews

- Conducted 13 interviews between April 1 and April 19, 2019
  - 2 cow-calf rangeland operations
  - 1 specialty livestock farm
  - 2 Christmas tree farms
  - 4 wine grape growers
  - 1 small mixed vegetable operation
  - 3 diversified apple/berry/fruit operations
- Interview topics included:
  - Business practices, production, costs, and markets
  - Irrigation management practices and costs
  - Discussion of EDC factors that could encourage or limit future agricultural development

Interview Feedback: Economics

- EDC markets
  - Direct to consumer
  - Specialty wholesale
  - Wholesale
- Crop production costs validated and updated
  - Labor costs and availability
  - Custom operation costs
  - Owner-operator labor costs and return to management
- Direct to consumer value added markets
  - Apple Hill, farmers markets, EDC wines, local farm stands

Interview Feedback: Irrigation

- Most growers deliberately located in EID and appreciate EID's flexible, affordable service
- Water availability generally not identified as a factor limiting growth
- Various configurations of drip and sprinkle systems most common; some dual systems
- Most growers reported using EID's IMS system for irrigation scheduling, typically with adjustments
- Most growers manage water carefully from an agronomic perspective, but do not track water use or costs

Interview Feedback: Other Considerations

- Key concerns identified include:
  - Oak Ordinance (new, uncertain enforcement)
  - Potential EID water cost changes (policy shift)
- Limited market opportunities cited as more important factor than water supply for growth
- Other constraints to expansion
  - Infrastructure (roads/traffic)
  - Places for visitors to stay (hotels, restaurants)
  - Difficulty working with wholesalers
  - Land costs
  - Labor availability

Economic Analysis

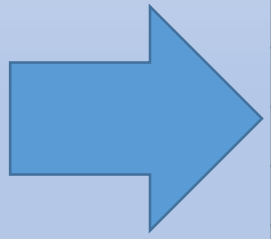
Economic Analysis
Objective and Approach

- Objective
  - Establish the value of water in crop production under current market conditions, and how it would change with expansion of irrigated agriculture (if water were available)
- Approach
  - Quantify production costs, returns, and markets for current and alternative EDC crops
  - Develop economic model to assess the value of water as EDC production expands, and optimally allocate land that is identified to be suitable for irrigated agriculture (DE analysis)

EDC Major Crop Updates

- Expanded total crops from 5 major crops and 2 alternatives to 9 major crops and 3 alternatives

Initial Major Crops
Apples
Pasture
Grapes
Misc. Deciduous
X-Mas Trees
Alt 1 (TBD)
Alt 2 (TBD)



Revised Major Crops	Market Type	Current Acres
Apples	DTC (Apple Hill)	587
Apples	Specialty Wholesale	65
Pasture	DTC (Specialty Meat)	813
Pasture	Wholesale	813
Grapes	DTC (Wine)	1,519
Grapes	Wholesale (Export)	1,012
Misc. Deciduous	DTC (Peaches)	229
Misc. Deciduous	Wholesale (Walnuts)	200
X-Mas Trees	DTC (You-Cut)	227
(Alt) Berries	DTC (Farmers Markets)	9
(Alt) Small Veg	DTC (Specialty Markets)	41
(Alt) Mandarins	Wholesale	56

EDC Crop Markets Overview

Crop	Market Type	Market Supply	Market Demand
Apples	**DTC**	EDC	Greater Sacramento Area[1]
Apples	**Specialty Wholesale**	California + U.S.	U.S. + Export
Pasture	**DTC**	EDC	Greater Sacramento Area
Pasture	**Wholesale**	U.S.	U.S.
Grapes	**DTC**	EDC	Greater Sacramento Area
Grapes	**Wholesale**	Portions of Crush Districts: 10, 8, and 7	U.S. + Export (mid-priced wines)
Misc. Deciduous	**DTC**	EDC	Greater Sacramento Area
Misc. Deciduous	**Wholesale**	California	U.S. + Export
X-Mas Trees	**DTC**	Greater Sacramento Area	Greater Sacramento Area
(Alt) Berries	**DTC**	EDC	Greater Sacramento Area
(Alt) Small Vegetable	**DTC**	EDC	Greater Sacramento Area
(Alt) Mandarins	**Wholesale**	California	U.S.

1. Includes Sacramento Area, EDC, Reno, and SF Bay Area

Apples

- Direct to consumer
  - Includes farmers markets and Apple Hill pies, ciders, you-pick, and other apple products
  - EDC supplies the entire market
  - Market growth depends on population and income growth (more Apple Hill visitors)
- Specialty wholesale
  - New apple varieties demanded by consumers that fetch a small price premium (e.g. Fuji, Honeycrisp)
  - EDC faces potentially large consumer demand, but expansion is limited by competition from other producers (e.g. Washington)

Irrigated Pasture

- Direct to consumer
  - Local milk and specialty meat production
  - EDC is 100% of market supply
  - Consumer demand is primarily local (within EDC)
  - EDC expansion would have a significant effect on price
- Wholesale
  - EDC is a small share of the total market supply, and faces a large consumer market
  - EDC expansion would have no effect on price

Wine Grapes

- Mid-price consumer wine market
- Supply is modeled jointly with portions of Crush Districts 8 and 7 (Central Coast)

- Direct to consumer
  - Includes EDC grapes (and any imports) bottled and labeled as EDC wines
  - Consumer demand includes cellar door sales, wine clubs, and local retail
- Wholesale
  - Out of EDC sales to Napa or other regions

Misc. Deciduous and X-Mas Trees

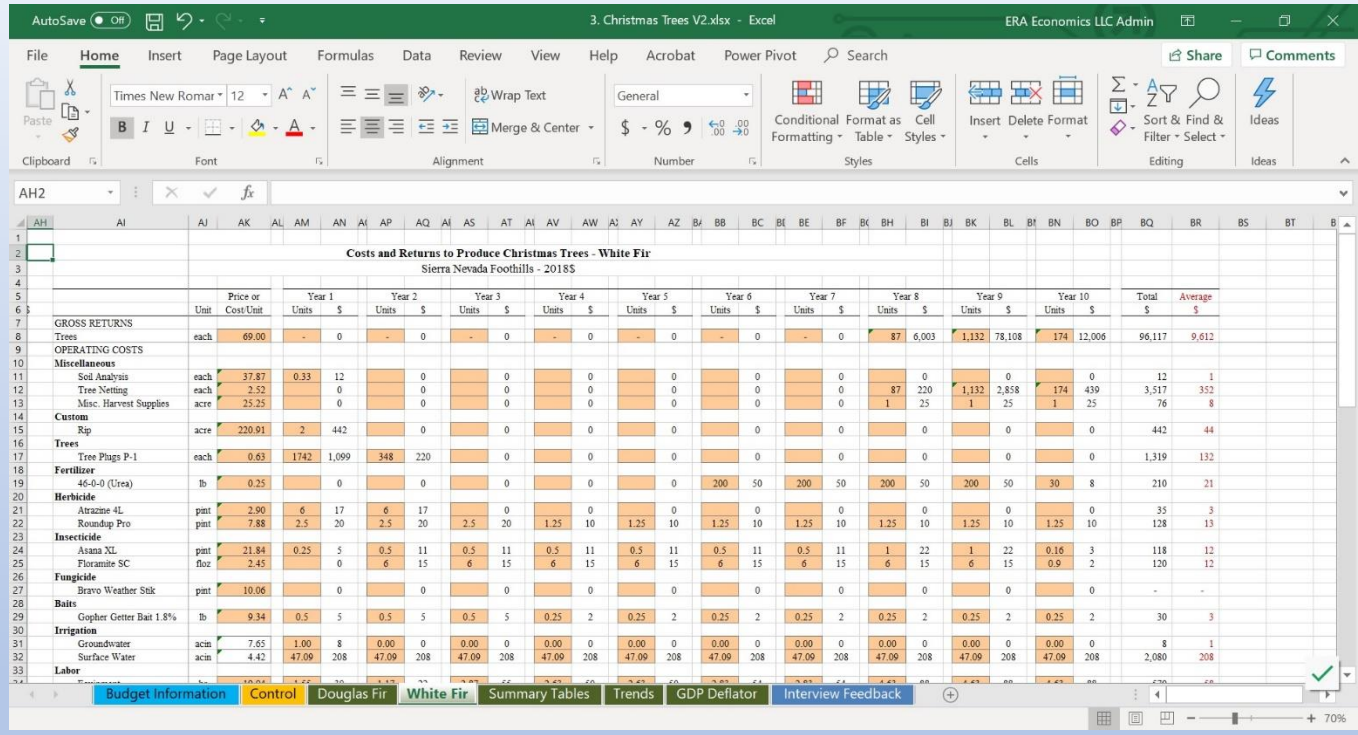
- Miscellaneous deciduous: walnuts
  - Wholesale market
  - EDC is a small share of supply and sells to a large market
- Miscellaneous deciduous: peaches
  - Local DTC sales (farmers markets, farm stands)
  - EDC is a large share of local supply and sells to a small market
- Christmas Trees
  - You-cut operations depend on demand from visitors
  - Limited or no irrigation on some farms
  - High value-added with DTC sales

Alternative Crops (3)

- Berries (blueberries)
  - DTC market for local sales and farmers markets
    - Evaluating potential for larger export market
  - EDC acreage is small and currently expanding to meet farmers market demand
- Citrus (mandarins)
  - Wholesale market with potential for specialty local demand
- Small mixed vegetable
  - Local (regional) demand from farmers markets and cooperatives

EDC Crop Markets, Costs, and Returns

- Each crop is characterized by:
  - Itemized operating costs
  - Itemized capital costs



3. Christmas Trees V2.xlsx - Excel

Costs and Returns to Produce Christmas Trees - White Fir

Sierra Nevada Foothills - 2018$

	Unit	Price or Cost/Unit	Year 1 Units	Year 1 $	Year 2 Units	Year 2 $	Year 3 Units	Year 3 $	Year 4 Units	Year 4 $	Year 5 Units	Year 5 $	Year 6 Units	Year 6 $	Year 7 Units	Year 7 $	Year 8 Units	Year 8 $	Year 9 Units	Year 9 $	Year 10 Units	Year 10 $	Total $	Average $
GROSS RETURNS																								
Trees	each	69.00	-	0	-	0	-	0	-	0	-	0	-	0	-	0	87	6,003	1,132	78,108	174	12,006	96,117	9,612
OPERATING COSTS																								
Miscellaneous																								
Soil Analysis	each	37.87	0.33	12		0		0		0		0		0		0		0		0		0	12	1
Tree Netting	each	2.52		0		0		0		0		0		0		0	87	220	1,132	2,858	174	439	3,517	352
Misc. Harvest Supplies	acre	25.25		0		0		0		0		0		0		0	1	25	1	25	1	25	76	8
Custom																								
Rip	acre	220.91	2	442		0		0		0		0		0		0		0		0		0	442	44
Trees																								
Tree Plugs P-1	each	0.63	1742	1,099	348	220		0		0		0		0		0		0		0		0	1,319	132
Fertilizer																								
46-0-0 (Urea)	lb	0.25		0		0		0		0		0	200	50	200	50	200	50	200	50	30	8	210	21
Herbicide																								
Atrazine 4L	pint	2.90	6	17	6	17		0		0		0		0		0		0		0		0	35	3
Roundup Pro	pint	7.88	2.5	20	2.5	20	2.5	20	1.25	10	1.25	10	1.25	10	1.25	10	1.25	10	1.25	10	1.25	10	128	13
Insecticide																								
Asana XL	pint	21.84	0.25	5	0.5	11	0.5	11	0.5	11	0.5	11	0.5	11	0.5	11	1	22	1	22	0.16	3	118	12
Floramite SC	floz	2.45		0	6	15	6	15	6	15	6	15	6	15	6	15	6	15	6	15	0.9	2	120	12
Fungicide																								
Bravo Weather Stik	pint	10.06		0		0		0		0		0		0		0		0		0		0	-	-
Baits																								
Gopher Getter Bait 1.8%	lb	9.34	0.5	5	0.5	5	0.5	5	0.25	2	0.25	2	0.25	2	0.25	2	0.25	2	0.25	2	0.25	2	30	3
Irrigation																								
Groundwater	acin	7.65	1.00	8	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	8	1
Surface Water	acin	4.42	47.09	208	47.09	208	47.09	208	47.09	208	47.09	208	47.09	208	47.09	208	47.09	208	47.09	208	47.09	208	2,080	208
Labor																								

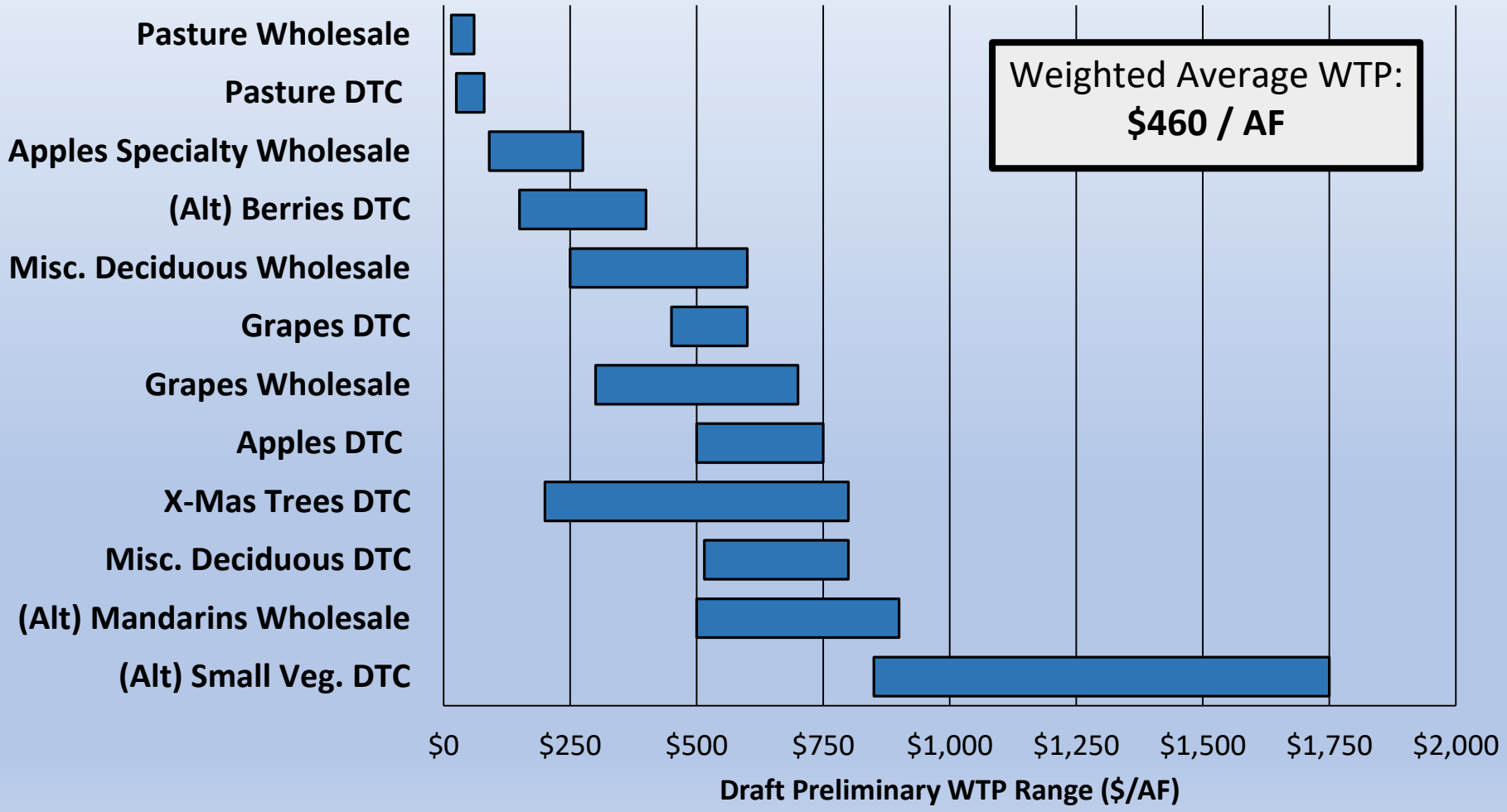
Budget Information | Control | Douglas Fir | White Fir | Summary Tables | Trends | GDP Deflator | Interview Feedback

- Full cost of "unpriced" inputs (owner-operator time, return to management, return to risk)
- Developed as series of crop budget models tailored to EDC conditions

EDC Economic Analysis

- This analysis establishes the "willingness to pay" (WTP) for irrigation water for EDC crops
  - WTP is a measure of irrigation water value to the producer
  - WTP is compared to the cost of developing new water supply when assessing feasibility (beyond the scope of this analysis)
- Economic approach is the Residual Valuation Method
  - Other approaches were considered, and used as a cross-check on reasonableness of results
- WTP changes with crop net returns
  - Important considerations for this analysis include acreage expansion or growth in consumer demand

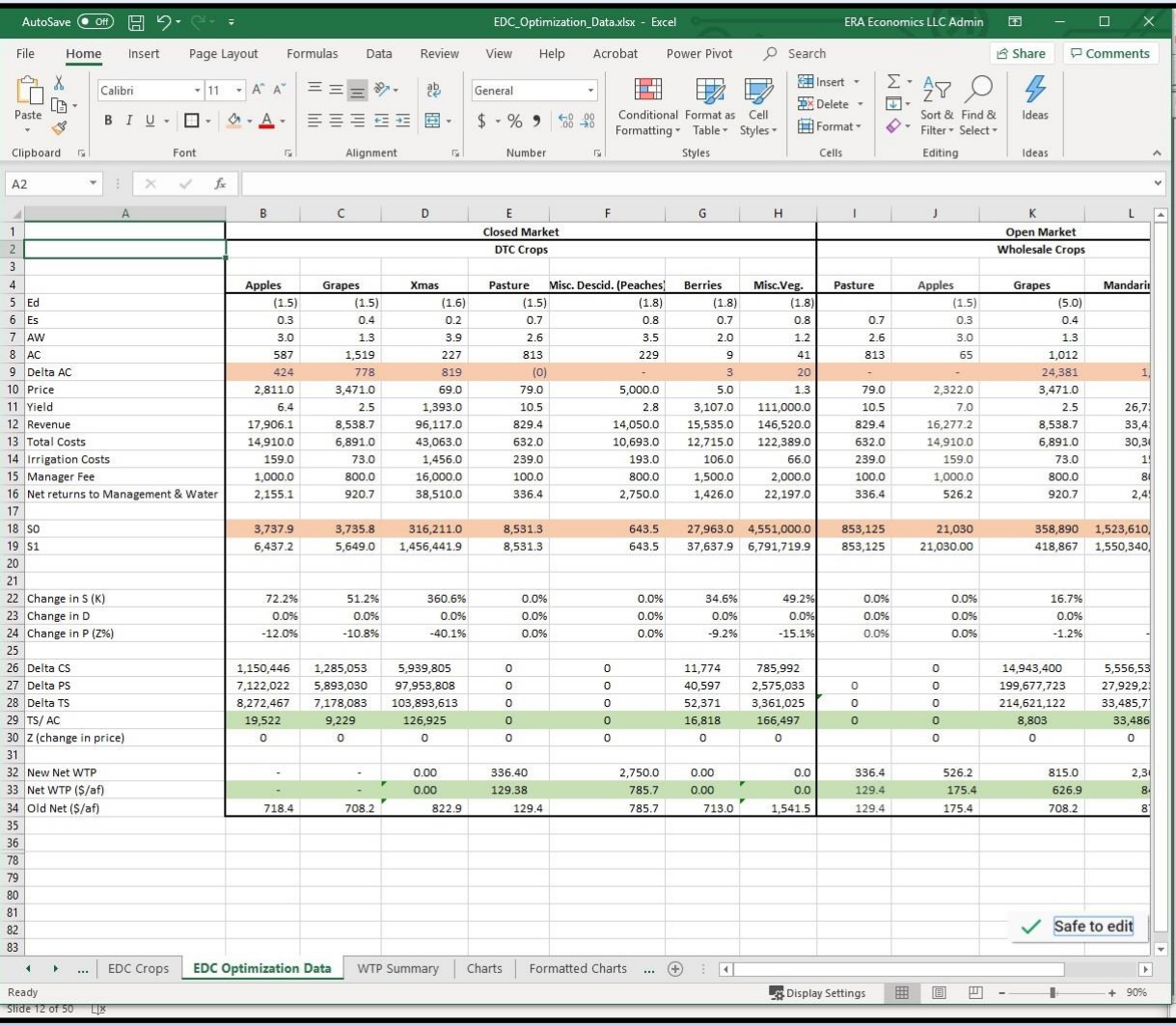
Preliminary (Current) WTP Estimates



Quantifying WTP as Acreage Expands

- Developed an economic analysis (model) of key EDC crops, alternative crops, and markets
- WTP for water is a result of crop markets and the net return to crop production
  - Acreage expansion identified in the land suitability analysis
  - Consumer market demand increases over time
- Model evaluates 'optimal' allocation of land suitable for agriculture
- The economic analysis does not consider:
  - Water supply cost
  - Infrastructure cost
  - Land development costs and constraints

EDC Agricultural Economic Model



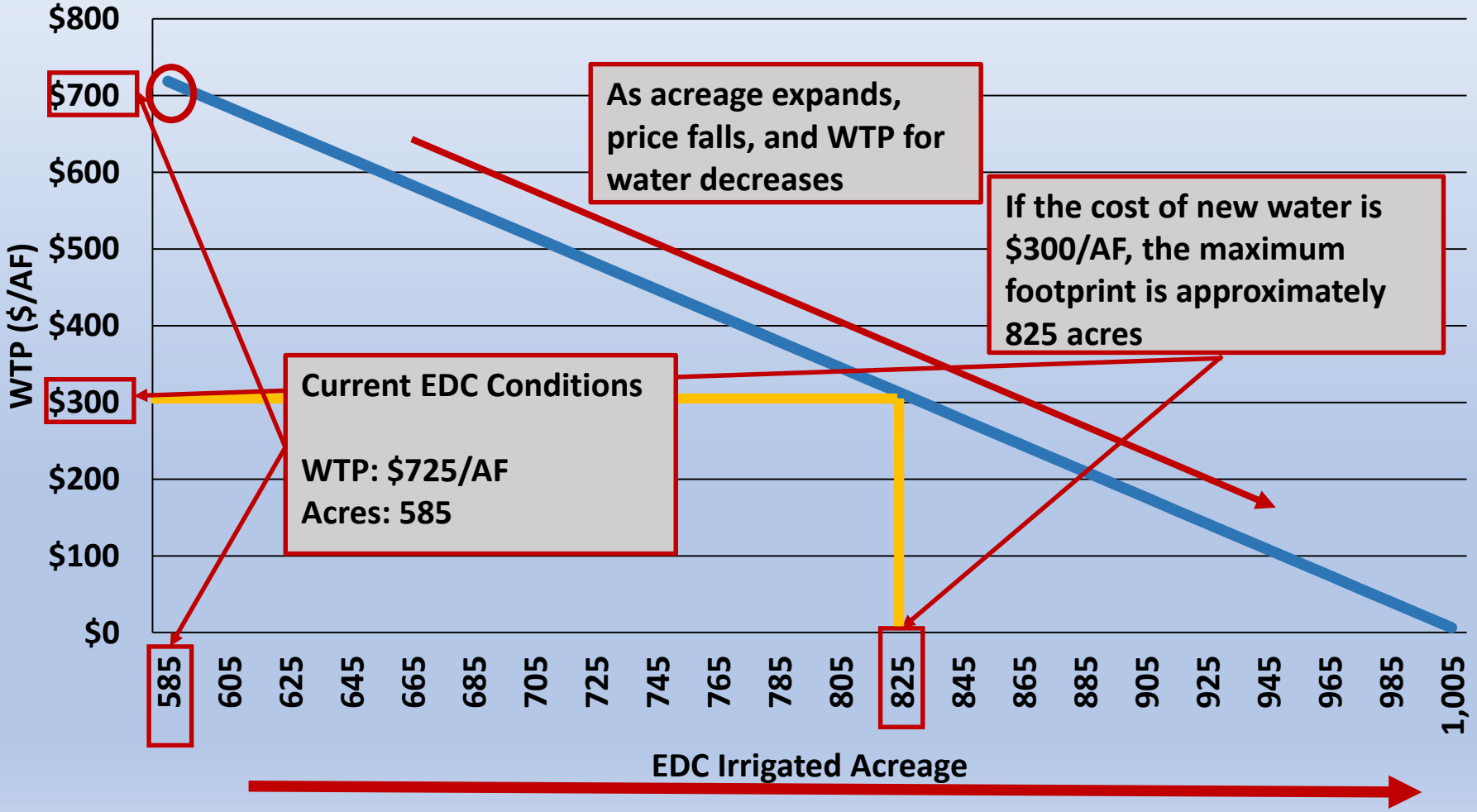
		Closed Market							Open Market			
		DTC Crops							Wholesale Crops			
		Apples	Grapes	Xmas	Pasture	Misc. Descid. (Peaches	Berries	Misc.Veg.	Pasture	Apples	Grapes	Mandari
5	Ed	(1.5)	(1.5)	(1.6)	(1.5)	(1.8)	(1.8)	(1.8)		(1.5)	(5.0)	
6	Es	0.3	0.4	0.2	0.7	0.8	0.7	0.8	0.7	0.3	0.4	
7	AW	3.0	1.3	3.9	2.6	3.5	2.0	1.2	2.6	3.0	1.3	
8	AC	587	1,519	227	813	229	9	41	813	65	1,012	
9	Delta AC	424	778	819	(0)	-	3	20	-	-	24,381	1
10	Price	2,811.0	3,471.0	69.0	79.0	5,000.0	5.0	1.3	79.0	2,322.0	3,471.0	
11	Yield	6.4	2.5	1,393.0	10.5	2.8	3,107.0	111,000.0	10.5	7.0	2.5	26,7
12	Revenue	17,906.1	8,538.7	96,117.0	829.4	14,050.0	15,535.0	146,520.0	829.4	16,277.2	8,538.7	33,4
13	Total Costs	14,910.0	6,891.0	43,063.0	632.0	10,693.0	12,715.0	122,389.0	632.0	14,910.0	6,891.0	30,3
14	Irrigation Costs	159.0	73.0	1,456.0	239.0	193.0	106.0	66.0	239.0	159.0	73.0	1
15	Manager Fee	1,000.0	800.0	16,000.0	100.0	800.0	1,500.0	2,000.0	100.0	1,000.0	800.0	8
16	Net returns to Management & Water	2,155.1	920.7	38,510.0	336.4	2,750.0	1,426.0	22,197.0	336.4	526.2	920.7	2,4
18	S0	3,737.9	3,735.8	316,211.0	8,531.3	643.5	27,963.0	4,551,000.0	853,125	21,030	358,890	1,523,610
19	S1	6,437.2	5,649.0	1,456,441.9	8,531.3	643.5	37,637.9	6,791,719.9	853,125	21,030.00	418,867	1,550,340
22	Change in S (K)	72.2%	51.2%	360.6%	0.0%	0.0%	34.6%	49.2%	0.0%	0.0%	16.7%	
23	Change in D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
24	Change in P (Z%)	-12.0%	-10.8%	-40.1%	0.0%	0.0%	-9.2%	-15.1%	0.0%	0.0%	-1.2%	
26	Delta CS	1,150,446	1,285,053	5,939,805	0	0	11,774	785,992		0	14,943,400	5,556,53
27	Delta PS	7,122,022	5,893,030	97,953,808	0	0	40,597	2,575,033	0	0	199,677,723	27,929,2
28	Delta TS	8,272,467	7,178,083	103,893,613	0	0	52,371	3,361,025	0	0	214,621,122	33,485,7
29	TS/ AC	19,522	9,229	126,925	0	0	16,818	166,497	0	0	8,803	33,486
30	Z (change in price)	0	0	0	0	0	0	0		0	0	0
32	New Net WTP	-	-	0.00	336.40	2,750.0	0.00	0.0	336.4	526.2	815.0	2,3
33	Net WTP ($/af)	-	-	0.00	129.38	785.7	0.00	0.0	129.4	175.4	626.9	8
34	Old Net ($/af)	718.4	708.2	822.9	129.4	785.7	713.0	1,541.5	129.4	175.4	708.2	8

```
            DELTA2(I)       CALIBRATED ;

POSITIVE VARIABLE  GAMMA2, DELTA2;


EQUATIONS
            OBJECTIVEEPS    OBJECTIVE
            PMPCON(I)
            ELASCON(I)              ;


      OBJECTIVEEPS..  VALOROB =E= SUM((I)$(XLND(I)AND NET2(I)), ( SQR(EPS2(I))))

      PMPCON(I)$((XLND(I)GT 1.0) AND (LHS1(I) GT 0))..
        LOG(LHS1(I)+ 0.001) - LOG((GAMMA2(I)* DELTA2(I)) + 0.001) =E= (GAMMA2(I)*

      ELASCON(I)$((XLND(I)GT 1.0) AND (LHS1(I) GT 0) AND (TREV2(I) GT 0))..
        LOG( ELAS(I) * GAMMA2(I) * DELTA2(I)*XLND(I)+ 0.001 ) + (GAMMA2(I)*XLND(I

*****************************************************************************

 MODEL  LEASTSQ /OBJECTIVEEPS, PMPCON, ELASCON /

*****************************************************************************
  LOOP(G,

     LHS1(I) = LA(G,I,"LAND")+ C(G,I,"LAND")    ;
     XLND(I)  =   X(G,I,"LAND") ;
     NET2(I)  = NET(G,I) ;
     TREV2(I)  = V(G,I)* YB(G,I) ;

* INITIAL VALUES

     EPS2.L(I)  =  0.1 ;
     EPS2.FX(I)$(XLND(I) LT 1.01)  =  0 ;
     EPS2.LO(I)$(XLND(I) LT 1.01)  =  -100000 ;
     EPS2.UP(I)$(XLND(I) LT 1.01)  =   100000 ;

     GAMMA2.FX(I)$(XLND(I) LT 1.01) = 0 ;
     GAMMA2.L(I)$(XLND(I) GT 1.01) = 1.2 ;
     GAMMA2.LO(I)$(XLND(I) GT 1.01) = 0.00001 ;
     GAMMA2.UP(I)$(XLND(I) GT 1.01) =  5.0 ;

     DELTA2.FX(I)$(XLND(I) LT 1.01) = 0 ;
     DELTA2.L(I)$(XLND(I) GT 1.01) = 1.2 ;
     DELTA2.LO(I)$(XLND(I) GT 1.01) = 0.25* LHS1(I) ;
     DELTA2.UP(I)$(XLND(I) GT 1.01) = 0.75* LHS1(I) ;

SOLVE  LEASTSQ USING NLP MINIMIZING VALOROB;

     GAMMA22(G,I) = GAMMA2.L(I) ;
     DELTA22(G,I) = DELTA2.L(I) ;
```

WTP Analysis Example: Direct to Consumer Apples

- Example shows economic analysis of increasing water supply scenarios
- Supply expands and puts downward pressure on price, net returns fall, which causes WTP to decrease
- Increasing consumer demand puts upward pressure on price, net returns rise, which causes WTP to increase
  - Growth in Sacramento area population and income
  - Demand is held constant in this example

Direct to Consumer Apples WTP Example (*presentation is animated*)



Preliminary Assessment of Markets and Potential for EDC Expansion

1. EDC crops that face a large consumer market can expand with little effect on WTP

2. EDC crops that are a small share of total market supply can expand acreage with moderate decrease in WTP

3. WTP falls quickly as acreage expands for EDC crops that are a significant share of supply and sell to local consumers

Next Steps

- Refine crop market characteristics, data, and economic model
- Finalize current WTP and projected growth in crop demands (consistent with WRDMP timeline)
- Integrate land suitability analysis and applied water requirements into economic model
- Evaluate potential agricultural expansion that is consistent with land suitability analysis and can be supported by the market for EDC crops

Land Suitability Analysis

Land Suitability Analysis Objective and Approach

- Objective
  - Identify West Slope lands with physical and other characteristics suitable for expansion of irrigated agriculture
- 3-Step Screening/Selection Approach
  - Develop database of potential fields
  - “Coarse” screening to identify fields meeting basic eligibility criteria (not crop-specific)
  - “Fine” screening to identify fields meeting suitability factors (crop-specific)
- Spreadsheet model allows convenient alternative analyses through user settings

Fields (not Parcels) are Basis of Analysis

- Fields defined as areas within legal parcels meeting basic physical eligibility criteria:
  - Elevation below 4,000 feet
  - Slope less than 15%
  - Area greater than 1 acre
- Referred to as “ParcelFields”
- Broadly inclusive West Slope database of potential new ag land
  - 16,432 ParcelFields
  - 98,224 acres
  - Average 6.0 acres/ParcelField

Factors in ParcelField Database

- Elevation
- Slope (min, max, avg.)
- Size (1 ac min)
- General Plan land use designation
- Ownership
- Land capability classification (1-8)
- Shape (P/A ratio)
- Slope variability
- Exposure (aspect)
- Existing land use/cover
- Oak Woodland designation
- In/out of surface water purveyor area
- Proximity to closest:
  - Primary road
  - Secondary road
  - Existing irrigated field
- Crop on closest irrigated field

ParcelField Database and Screening Model Interface

Color	Definition	Description
	Qualifying Characteristic	Characteristic applied in first screening step, excludes ParcelFields least desirable for agricultural development
	Screening Characteristic	Characteristic applied in second screening step, identifies ParcelFields most desirable for agricultural development
	Observational Characteristic	Characteristic not applied to screening; however characteristic provides more information about screening process and results
	User-Defined Criteria	Cells can be defined by user to screen results to those matching criteria set, detailed description below (Row 7)

The yellow-highlighted row contains criteria that can be adjusted to automatically filter ParcelFields to show those matching criteria; the ParcelFields and their characteristics that meet all criteria are shown in the **Results** tab. The sum

	ParcelField Characteristics						Physical Location Characteristics												
Characteristic Conditions	Land Ownership	Land Designation	Acreage	Perimeter-Area Ratio	ParcelField Polygon Count	Lower Average Elevation	Upper Average Elevation	Minimum Elevation	Maximum Elevation	Range in Elevation	Average Slope	Slope Variability	Minimum Slope	Maximum Slope	Range in Slope	Average Aspect	Minimum Aspect	Maximum Aspect	Range in Aspect
	Equal to	*Equal to*	*Greater than*	*Less than*	*Less than*	*Greater than or Equal to*	*Less than or Equal to*	*Greater than*	*Less than*	*Less than*	*Less than*	*Less than*	*Greater than*	*Less than*	*Less than*	*Less than*	*Greater than*	*Less than*	*Less than*
Criteria:	***Private***	***Ag***	***1***				***4,000***				***15***								
Instructions (or Units for Numerical Characteristics)	Private or Public or Blank	Ag or Blank	Acres	Feet/Acres	Number	Feet above Mean Sea Level				Feet	Degrees					Cosine of Aspect in Degrees (1 represents directly northward, -1 directly southward, 0 directly eastward			
Summary statistics (for Parcel Fields meeting all criteria)	***Count of ParcelFields:***	***4,691***																	
	Total Acres:	***38,525***																	
	Average		*9.17*	*631*	*1*	*3,625*	*3,625*	*3,564*	*3,684*	*119*	*10*	*3*	*4*	*16*	*12*	*-0.21*	*-0.79*	*0.50*	*1.29*
	Minimum		*1.09*	*165*	*1*	*3,402*	*3,402*	*3,295*	*3,429*	*23*	*5*	*1*	*0*	*13*	*3*	*-0.95*	*-1.00*	*-0.80*	*0.14*
	Maximum		*81.20*	*1,556*	*1*	*3,948*	*3,948*	*3,912*	*3,992*	*357*	*14*	*5*	*12*	*20*	*19*	*0.94*	*0.74*	*1.00*	*2.00*

Data Criteria Results

	ParcelField Characteristics							Physical Location Characteristics												
ParcelField ID	Parcel ID	Land Ownership	Land Designation	Acreage	Perimeter-Area Ratio	ParcelField Polygon Count	Lower Average Elevation	Upper Average Elevation	Minimum Elevation	Maximum Elevation	Range in Elevation	Average Slope	Standard Deviation in Slope	Minimum Slope	Maximum Slope	Range in Slope	Average Aspect	Minimum Aspect	Maximum Aspect	Range in Aspect
00107115_1	00107115	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
00109227_1	00109227	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
00201133_1	00201133	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
00201138_1	00201138	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
00202108_1	00202108	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Instructions | Characteristics | **Data** | Results

ParcelField "Coarse" Eligibility Screening

- Eligibility Factors
  - Gen. Plan LU designation aligned with ag demands
  - Private Ownership (excludes public lands)
  - Excluded existing ag fields, urban development, and open water
  - Plus factors used to develop database
    - Elevation below 4,000 feet
    - Slope less than 15%
    - Area greater than 1 acre
- Results
  - 4,691 ParcelFields
  - 38,525 acres
  - Average 8.2 acres/ParcelField

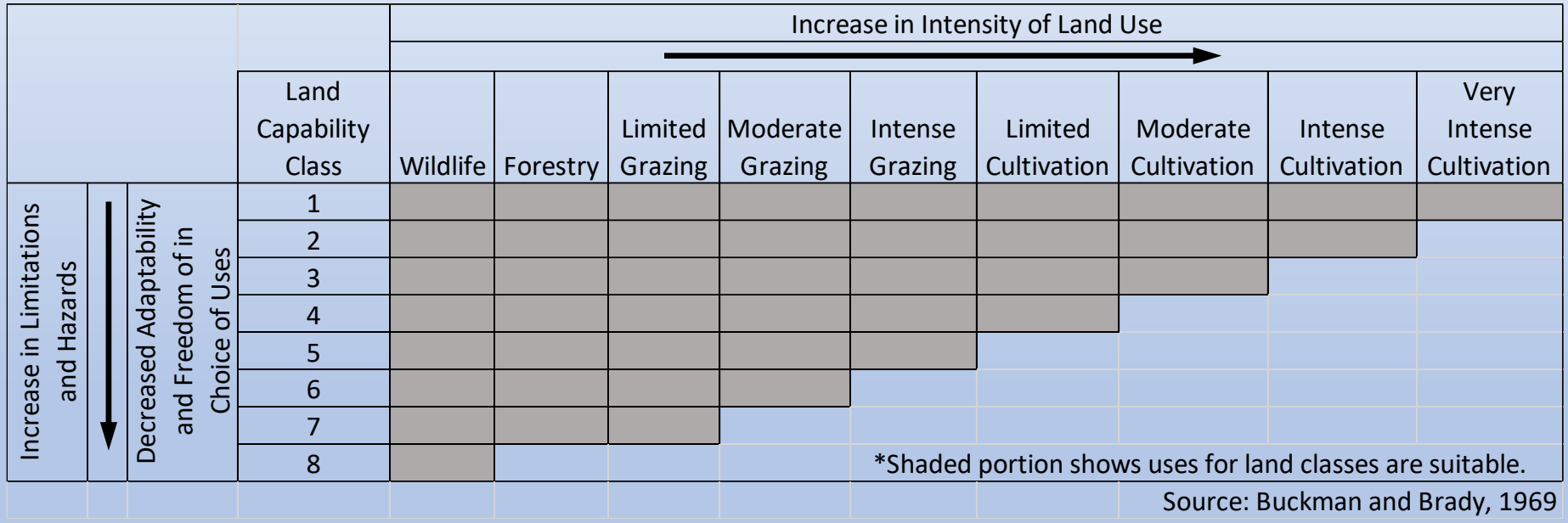
ParcelField "Fine" Crop-Specific Screening

- Analyze *existing* irrigated fields to define suitable characteristics for potential *future* irrigated fields

- Selected fine screening factors
  - Elevation
  - Average Slope
  - Land Capability Classification

Land Capability Classes

- System for grouping soils on their capability of sustainably producing cultivated crops

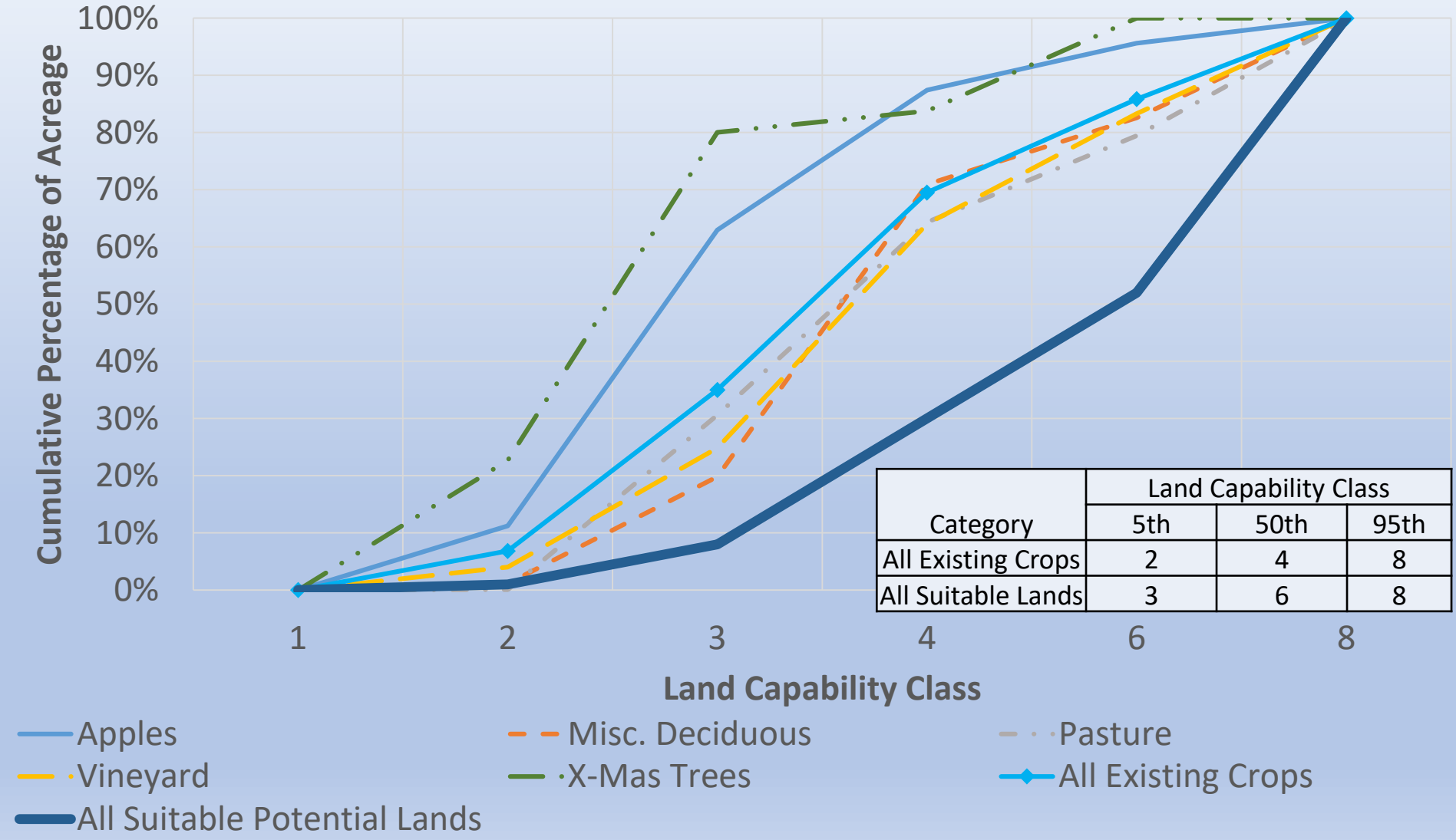


Note: Improvements in irrigation methods and systems have allowed increasing intensity of use in higher land capability classes.

Land Capability Class Distribution of Eligible ParcelFields

Land Capability Class	ParcelField Count	Total Acres	Total Percentage of Acres
1	0	0	0%
2	46	444	1%
3	270	2,863	7%
4	820	8,435	22%
5	0	0	0%
6	995	8,364	22%
7	144	1,169	3%
8	2,416	17,250	45%
Totals	4,691	38,525	100%

Distribution of Eligible ParcelFields and Existing Crops by Land Capability Class



Category	Land Capability Class		
	5th	50th	95th
All Existing Crops	2	4	8
All Suitable Lands	3	6	8

ParcelField "Fine" Crop-Specific Screening Preliminary Factors

- Screening factors generally defined by 5th and 95th percentiles of existing ag fields

Crop	Lower Elevation	Upper Elevation	Average Slope	General Land Capability Class
Apples	1,700	3,200	11	6
Miscellaneous Deciduous	0	2,700	12	8
Pasture	0	2,500	8	8
Vineyard	0	2,900	14	8
X-mas Trees	2,600	3,400	14	6

ParcelField "Fine" Crop-Specific Screening Preliminary Results

Crop	ParcelField Count	Total Acres
Apples	1,425	13,599
Miscellaneous Deciduous	3,589	33,213
Pasture	1,128	16,478
Vineyard	4,233	35,547
X-mas Trees	497	3,248

- Substantial overlap exists because many ParcelFields suitable for multiple crops
- Discrete results (overlap accounted for):
  - 4,484 ParcelFields
  - 37,021 total acres
  - Average 8.3 acres/ParcelField

ParcelField "Fine" Crop-Specific Screening Preliminary Results (Excluding Class 8)

Crop	ParcelField Count	Total Acres
Apples	1,425	13,599
Miscellaneous Deciduous	1,580	16,717
Pasture	669	9,382
Vineyard	1,808	17,930
X-mas Trees	497	3,248

- Substantial overlap exists because some ParcelFields suitable for multiple crops
- Discrete Results (e.g. no overlap):
  - 2,059 ParcelFields
  - 19,404 total acres
  - Average 9.4 acres/ParcelField

Potential Agricultural Expansion Land Suitability Analysis

- Google Earth Live Demo

Potential Screening Refinements as Analysis is Merged with Economics

- Limit or exclude Class 8 lands?
- Exclude odd-shaped ParcelFields?
- Exclude oak woodlands subject to ordinance (3,400 acres)?
- Other factors?

Comparison to Prior Analysis

- Prior Analysis: about 53,000 acres of potential agricultural expansion
- Current *Preliminary* Analysis: about 37,000 acres of potential agricultural expansion
  - Allowing up to Class 8 lands (key factor/decision)
  - No consideration of development costs
- Prior analysis applied coarser criteria; differences include:
  - Parcel-based (rather than field-based)
  - No evaluation of existing agriculture
  - Maximum slope of 30 degrees
  - No minimum limit on agricultural area (e.g. 1 acre)
  - No evaluation of land ownership

Next Steps

- Refine screening criteria and tool to determine final potential land use results
- Complete estimates of applied water use through root zone modeling
  - Searching for applied water records for calibration
- Integrate applied water use and potential agricultural expansion to determine total projected water requirements
- Document work-to-date and include additional work in project report

Thank You!
Questions and Discussion