2022 STATEWIDE LAND USE ACCURACY ASSESSMENT

After the final classification dataset was determined, a comprehensive accuracy assessment was completed. On average, over all crops including multi-crops, about one quarter of the independent ground truth samples were set aside for this purpose. A stratified random sampling method was used for accuracy assessment sample selection. The datasets were stratified by land cover type and county boundary. Prior to the accuracy assessment, the validation dataset was cleaned so that each data point corresponded to a single crop at a single point in time in a single field.

Accuracy assessment can be divided into three components:

1. Reference data sampling design – how much reference data is collected, when and where
2. Reference data response design – how reference data is collected
3. Analysis – how the reference data is used to determine accuracy and how that accuracy is expressed

In this section, Land IQ's approach to all three of these components is described, and results of the accuracy assessment are provided.

SAMPLING DESIGN

In conventional accuracy assessment theory, the minimum number of samples corresponding to a specific accuracy level is calculated. This method of minimum sample size determination is not always applicable to statistics with a spatial or temporal component. In this instance, it would require knowledge of the exact location and timing of cropping statewide in advance of the ground surveys, which is not available. Therefore, Land IQ collects reference data by region or county and then partitions it into training and reference data sets for each crop based on an approximate 75%-25% split, respectively.

There are several reasons for this approach, but the main reason is that it is far more efficient to collect both training and validation data simultaneously when the reference data is collected by ground survey, particularly in the case of time sensitive crops such as annuals that need to be sampled within a narrow window of time. This approach results in both types of data being concentrated where crops are concentrated (e.g., in counties with high acreage of agricultural crops). This approach also results in more data (for both calibration and validation) being collected for predominant, high acreage crops and less data being collected for minor, low acreage crops. While this method may result in unequal distribution of samples across classes, the distribution represents the true extent and probability of each class, ensuring that the overall accuracies are truly representative of hydrologic regions and the State as a whole. Additionally, a portion of data collection efforts is focused on crops for which data are sparser, adjusting routes each year to capture more data in areas where these less prevalent crops are produced.

RESPONSE DESIGN

Reference data can be collected by different means from different sources. Currently, Land IQ collects reference data for model training and validation from cropped areas in California by conducting on-the-ground "ground truth" survey. For the purposes here, ground truth data and reference data are synonymous.

Because the ground truth surveys are real-time (as opposed to using previously acquired data such as archival imagery) and require the presence of staff, logistical considerations must be made. First, on-the-ground reference data surveys must be made when the crop is growing. This requirement introduces an element of timing, which is especially important for short-season crops. Second, because the area mapped in California is so large, knowledge of where some cropped fields are, especially for minor crops, is approximate and often changes from year to year. In addition, because so many crops are mapped that vary in acreage, some crops for which there is little existing reference data are prioritized for reference point data collection.

For these reasons, Land IQ uses the basic concepts of sampling design to achieve independent and random samples in addition to considering criteria to prioritize reference point data collection:

- Confidence level – Crops with estimated lower accuracy and confidence levels from the previous year's mapping effort are prioritized for ground truth data collection.
- Peak date – Time series analysis is used to find dates of peak reflectance in fields to determine the seasonality of crops and help optimize timing of ground truth data collection around peak growing seasons.

Despite these efforts to gather representative data across cropping systems, the validation dataset may still contain a statistically small sample size for certain low prevalence crop classes. To include as much validation data as possible without skewing overall accuracies and maintaining statistical validity, a minimum sample size of 10 data points was enforced for inclusion in accuracy assessments. In the rare instance where a crop with high prevalence in a region did not have enough validation data from ground surveys, supplemental data was independently added using photo interpretation and/or prior year's ground truthing data.

ANALYSIS

Uncertainty in crop classification is related to two issues: accuracy and precision.

ACCURACY

Accuracy is a relative measure of the exactness of an estimate and accounts for systematic errors. Therefore, an accurate estimate does not systematically over- or underestimate the true value. Map accuracy can be quantified by creating an error matrix (also commonly called a confusion matrix), which compares the map classification with a reference classification.

The underlying principle of the accuracy assessment is that it compares the mapped land classification to reliable reference data, collected through sample-based approaches, as described above. The objective of a validation data set, therefore, is to provide a statistically sound estimate of the accuracy of the output map based on an independent reference information source. The accuracy of a map is assessed by measuring the degree of agreement between the output map and the validation data set. An error matrix can be generated that compares the pixels or polygons in the resulting classification map to the known reference points. From this matrix, overall accuracy and accuracy of each class can be determined.

There are three measures of accuracy that can be determined from an error matrix:

1. Overall accuracy
2. Producer's accuracy (omission error)
3. User's accuracy (commission error

Typically, accuracy of remotely sensed maps is demonstrated using an error (or confusion) matrix (Table 7). Accuracy measures that can be derived from an error matrix are described below.

OVERALL ACCURACY

Overall accuracy is calculated as the total number of correctly classified fields divided by the total number of fields. It measures the accuracy of the whole map but does not refer to any individual classes. It is the probability that a randomly selected location on the map is correctly classified. Overall accuracy is sensitive to sample size and is thus more reliable in classes with larger samples. It is the sum of the major diagonal in an error matrix that runs from the upper left corner to the bottom right corner of the matrix.

OMISSION ERROR

Omission error refers to the number of reference samples that were incorrectly classified. It is reported on the right side of the matrix.

PRODUCER'S ACCURACY

Producer's accuracy is described by the probability that a reference point is correctly classified. It indicates how well the area represented by the map can be classified. It is also reported on the right side of the matrix and can be calculated as the inverse of the omission error.

COMMISSION ERROR

Commission error refers to the number of classified samples that were incorrectly classified. It is reported at the bottom of the matrix.

USER'S ACCURACY

User's accuracy is described as the probability that a predicted point is correctly classified. It indicated the reliability that a field classified on the map truly represents that class on the ground. It is also reported at the bottom of the matrix and can be calculated as the inverse of the commission error.

PRECISION

Precision is related to the random error, which can be quantified by a confidence interval. A confidence interval gives a range that encloses the true value of an unknown fixed quantity with a specified probability. A precise estimate would thus have a small confidence interval.

RESULTS

In the WY 2022 analysis, 14,030 samples were used for accuracy assessment. These sites were not used to train the classification process and therefore represent unbiased reference information. Accuracy was assessed based on both the DWR Crop Class legend level and the more refined subclass legend level and results are generated geographically for statewide mapping, as well as hydrologic regions.

The hydrologic regions used for the accuracy assessment are displayed in Figure 10. In 2022, an accuracy assessment was performed for all hydrologic regions after identifying a need for the data in the year prior.

In the statewide and regional accuracy assessment, crops with less than 10 data points in the validation dataset were excluded. All excluded crops represent < 2% of the total cropped area in their respective regions. This indicates minimal impact of crop exclusion on the overall accuracy of the region.

In some cases, crop classes are closely related, making accuracy assessment more difficult. This primarily occurs in forage crop classes where the class designation depends on the way the crop is managed and/or harvested (e.g., miscellaneous grasses and mixed pasture). In these cases, a field may alternate between these in any given season.

Validation data was further cleaned and pre-processed using the following methods:

1. Data points that were not representative of the entire field were excluded from the analysis. This was evaluated by comparing against high to medium resolution imagery.
2. In the case of perennial fields, multiple ground survey points could have been recorded for the same field and the same class during consecutive survey events. This would result in an over-representation of the field in the validation dataset. Such points were cleaned such that a single field contained only a single reference point.
3. In the case of annual fields, as these are grown over shorter periods, a crop may or may not have been observed during the ground survey depending on the timing or may have been observed multiple times in areas that are surveyed multiple times per year. In such cases, the reference points were linked to the corresponding cropping segment to correctly assess accuracy. In this way, multi-cropping instances were included in the accuracy assessment.

Figure 1. Hydrologic Regions Used for WY 2022 Regional Accuracy Assessment

Overall Accuracy

Accuracy statistics were calculated independently for each region (statewide and hydrologic) as well as each level of legend (DWR Class and Subclass). The overall accuracy for WY 2022 crop mapping statewide was 98% at the DWR Crop Class legend level and 97% at the Subclass legend level (Table 6). Overall accuracy by hydrologic region is displayed in Table 7. Only crop classes represented by at least 10 fields in the validation data for a hydrologic region were included in the assessment.

Table 1. WY 2022 Overall Statewide Land Use Mapping Weighted Accuracy

Crop Legend	Overall Accuracy (%)
DWR Class	98%
Subclass (Land IQ)	97%

Table 2. WY 2022 Overall Land Use Mapping Weighted Accuracy by Hydrologic Region

Crop Legend	Central Coast	Colorado River	North Coast	North Lahontan	Sacramento River
DWR Class	99%	99%	98%	97%	99%
Subclass (Land IQ)	94%	97%	93%	90%	97%
	San Francisco Bay	**San Joaquin River**	**South Coast**	**South Lahontan**	**Tulare Lake**
DWR Class	97%	99%	99%	98%	99%
Subclass (Land IQ)	99%	98%	92%	97%	99%

The error matrices for crops at the DWR Crop Class legend level and the Subclass legend level for statewide and hydrologic regions (Tables 46 – 57 at the end of this report) show overall accuracy, omission and commission error, and kappa statistics by crop class (in acres).

Accuracy by Crop Class

Accuracy was calculated for each crop (percentage of reference fields correctly classified in each crop category) for both DWR Class and Subclass legends statewide (Tables 8 and 9). In addition to the statewide assessment, accuracy was also determined at the hydrologic region level (Tables 23 – 32). Some land cover types (e.g., apples, kiwis, subtropical fruits) and hydrologic regions are not included in the accuracy assessment due to insufficient data. In these cases, there were either no or less than ten samples available for accuracy assessment. A weighted accuracy assessment was conducted for each crop class by hydrologic region. Count based accuracies were first calculated for each crop class as the percent of reference fields correctly classified. Weights for each crop were independently calculated as the percent of total cropped area represented by the respective crop. The count-based accuracies were then multiplied by their respective weight by crop category and region. These weighted accuracies were then summed across all crops in the region to yield the overall weighted accuracy for the respective region. Crop weights and accuracies by region are included in Tables 10-16. Results for the same calculations applied to area-based accuracies are included in Appendix A.

In total, the multi-crop resolution of mapping data in WY 2022 captures the vast majority of the cropping year-round in the state, allowing data users to characterize crop production and water use more accurately. Some crop rotations may occasionally be missed; this is because satellite data are intermittent and cropping is rotational and, in some cases, very short term. For this reason, available data will occasionally miss a rotational crop timing. However, any missed crops are short season in nature and therefore have a smaller impact on total water use analysis. It should also be noted that young perennials, while a smaller class, are challenging to detect with remote sensing approaches and can be confused with fallow until features are detectable. This is particularly true in years when higher resolution (e.g., NAIP) image resources are not available.

Table 3. WY 2022 Statewide Land Use Mapping Weighted Accuracy by DWR Crop Class Legend Level

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Citrus and Subtropical	1,088	1,081	4.6%	99.4%	4.6%
Deciduous Fruits and Nuts	3,759	3,754	28.8%	99.9%	28.8%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Field Crops	1,153	1,110	9.2%	96.3%	8.8%
Grain and Hay	1,093	1,020	10.5%	93.3%	9.8%
Pasture	1,905	1,877	15.6%	98.5%	15.3%
Rice	152	152	2.7%	100.0%	2.7%
Truck, Nursery and Berry Crops	2,315	2,294	12.2%	99.1%	12.1%
Unclassified	1,431	1,397	7.1%	97.6%	7.0%
Vineyard	1,002	999	7.8%	99.7%	7.8%
Young Perennial	132	105	1.5%	79.5%	1.2%
Total Weighted Accuracy Statewide				**98.3%**	**98.1%**

Table 4. WY 2022 Statewide Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	1,009	991	6.4%	98.2%	6.3%
Almonds	2,070	2,067	16.2%	99.9%	16.2%
Apricots	16	15	0.1%	93.8%	0.0%
Avocados	529	526	0.6%	99.4%	0.5%
Beans (Dry)	25	10	0.1%	40.0%	0.0%
Bush Berries	102	99	0.2%	97.1%	0.2%
Carrots	47	47	0.6%	100.0%	0.6%
Cherries	100	96	0.4%	96.0%	0.4%
Citrus	366	350	3.2%	95.6%	3.1%
Cole Crops	426	402	1.7%	94.4%	1.6%
Corn, Sorghum, and Sudan	846	825	6.5%	97.5%	6.3%
Cotton	162	161	1.4%	99.4%	1.4%
Dates	79	77	0.1%	97.5%	0.1%
Flowers, Nursery, and Christmas Tree Farms	176	172	0.4%	97.7%	0.4%
Grapes	1,002	999	7.8%	99.7%	7.8%
Lettuce or Leafy Greens	389	381	2.8%	97.9%	2.8%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Melons, Squash, and Cucumbers	78	73	0.6%	93.6%	0.6%
Miscellaneous Deciduous	22	21	0.2%	95.5%	0.2%
Miscellaneous Field Crops	1,093	1,020	10.6%	93.3%	9.8%
Miscellaneous Grain and Hay	300	232	2.2%	77.3%	1.7%
Miscellaneous Grasses	22	9	0.0%	40.9%	0.0%
Miscellaneous Subtropical Fruits	383	297	1.6%	77.5%	1.2%
Miscellaneous Truck Crops	580	565	6.9%	97.4%	6.7%
Mixed Pasture	82	82	0.6%	100.0%	0.6%
Olives	83	81	0.7%	97.6%	0.7%
Onions and Garlic	132	132	0.7%	100.0%	0.7%
Peaches and Nectarines	50	50	0.1%	100.0%	0.1%
Pears	11	11	0.1%	100.0%	0.1%
Pecans	33	29	0.1%	87.9%	0.1%
Peppers	382	380	5.7%	99.5%	5.7%
Pistachios	25	25	0.2%	100.0%	0.2%
Plums	23	22	0.2%	95.7%	0.2%
Pomegranates	33	33	0.3%	100.0%	0.3%
Potatoes	137	136	0.5%	99.3%	0.4%
Prunes	152	152	2.7%	100.0%	2.7%
Rice	25	22	0.5%	88.0%	0.5%
Safflower	225	223	0.7%	99.1%	0.6%
Strawberries	38	37	0.3%	97.4%	0.2%
Sugar Beets	50	48	0.4%	96.0%	0.3%
Sunflowers	49	48	0.2%	98.0%	0.2%
Sweet Potatoes	291	282	2.4%	96.9%	2.3%
Tomatoes	176	172	0.4%	97.7%	0.4%
Turf	16	16	0.1%	100.0%	0.1%
Unclassified Fallow	1,431	1,397	7.2%	97.6%	7.0%
Walnuts	782	780	4.6%	99.7%	4.6%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Young Perennials	132	105	1.5%	79.5%	1.2%
Total Weighted Accuracy Statewide				**96.6%**	**96.7%**

Table 5. WY 2022 Central Coast Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Avocados	57	56	1.7%	98.2%	1.7%
Bush Berries	41	40	1.0%	97.6%	0.9%
Cole Crops	363	345	18.0%	95.0%	17.1%
Flowers, Nursery, and Christmas Tree Farms	90	88	0.9%	97.8%	0.9%
Grapes	115	114	16.8%	99.1%	16.6%
Lettuce or Leafy Greens	305	299	28.9%	98.0%	28.3%
Miscellaneous Grain and Hay	59	45	7.4%	76.3%	5.6%
Miscellaneous Truck Crops	191	138	9.9%	72.3%	7.1%
Mixed Pasture	22	22	1.8%	100.0%	1.8%
Onions and Garlic	10	9	0.7%	90.0%	0.6%
Strawberries	161	160	6.3%	99.4%	6.3%
Unclassified Fallow	89	87	6.2%	97.8%	6.0%
Walnuts	32	32	0.6%	100.0%	0.6%
Total Weighted Accuracy by Region					**93.6%**

Table 6. WY 2022 Colorado River Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	367	363	27.3%	98.9%	27.0%
Carrots	29	29	2.5%	100.0%	2.5%
Citrus	48	48	2.6%	100.0%	2.6%
Cole Crops	51	47	3.4%	92.2%	3.1%
Corn, Sorghum, and Sudan	71	67	9.7%	94.4%	9.1%
Cotton	27	27	1.2%	100.0%	1.2%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Dates	79	77	2.0%	97.5%	1.9%
Grapes	12	12	0.3%	100.0%	0.3%
Lettuce or Leafy Greens	49	49	0.7%	100.0%	0.7%
Melons, Squash, and Cucumbers	78	76	7.6%	97.4%	7.5%
Miscellaneous Grain and Hay	14	14	1.2%	100.0%	1.2%
Miscellaneous Grasses	116	113	7.5%	97.4%	7.3%
Miscellaneous Truck Crops	152	147	14.4%	96.7%	13.9%
Mixed Pasture	37	26	2.3%	70.3%	1.6%
Onions and Garlic	18	18	0.2%	100.0%	0.2%
Peppers	40	40	3.3%	100.0%	3.3%
Sugar Beets	11	11	0.4%	100.0%	0.4%
Unclassified Fallow	37	36	3.6%	97.3%	3.5%
Total Weighted Accuracy by Region					**97.0%**

Table 7. WY 2022 North Coast Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass[1]	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	101	99	15.4%	98.0%	15.1%
Grapes	124	124	16.3%	100.0%	16.3%
Miscellaneous Grain and Hay	59	46	13.9%	78.0%	10.8%
Mixed Grasses	27	15	7.9%	55.6%	4.4%
Mixed Pasture	64	63	37.9%	98.4%	37.3%
Potatoes	15	15	1.4%	100.0%	1.4%
Unclassified Fallow	57	57	7.1%	100.0%	7.1%
Total Weighted Accuracy by Region					**92.7%**

[1] A high proportion of mixed forage crops exist in this region that commonly can be confused and impact accuracy.

Table 8. WY 2022 North Lahontan Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass[1]	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	54	52	18.9%	96.3%	18.2%
Miscellaneous Grain and Hay	50	43	9.7%	86.0%	8.3%
Mixed Grasses	36	24	10.4%	66.7%	7.0%
Mixed Pasture	50	46	58.5%	92.0%	53.8%
Unclassified Fallow	27	24	2.4%	88.9%	2.1%
Total Weighted Accuracy by Region					**89.5%**

[1] A high proportion of mixed forage crops exist in this region that commonly can be confused and impact accuracy.

Table 9. WY 2022 Sacramento River Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	126	120	4.4%	95.2%	4.2%
Almonds	433	431	14.2%	99.5%	14.1%
Corn, Sorghum, and Sudan	55	52	2.2%	94.5%	2.1%
Grapes	111	110	2.8%	99.1%	2.7%
Melons, Squash, and Cucumbers	20	18	0.7%	90.0%	0.6%
Miscellaneous Deciduous	10	10	0.1%	100.0%	0.1%
Miscellaneous Grain and Hay	185	168	9.2%	90.8%	8.3%
Miscellaneous Grasses	60	35	2.2%	58.3%	1.3%
Mixed Pasture	178	176	14.0%	98.9%	13.8%
Olives	63	63	1.4%	100.0%	1.4%
Peaches and Nectarines	56	56	0.5%	100.0%	0.5%
Pears	50	50	0.3%	100.0%	0.3%
Pistachios	28	28	0.9%	100.0%	0.9%
Prunes	135	134	1.9%	99.3%	1.9%
Rice	144	144	12.1%	100.0%	12.1%
Safflower	13	10	0.8%	76.9%	0.6%
Sunflowers	50	48	1.7%	96.0%	1.6%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Tomatoes	109	107	3.6%	98.2%	3.6%
Unclassified Fallow	529	520	13.5%	98.3%	13.2%
Walnuts	450	449	12.1%	99.8%	12.1%
Young Perennial	24	21	1.4%	87.5%	1.2%
Total Weighted Accuracy by Region					**96.8%**

Table 10. WY 2022 San Francisco Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Grapes	156	156	58.3%	100.0%	58.3%
Miscellaneous Grain and Hay	15	15	28.3%	100.0%	28.3%
Mixed Pasture	13	12	8.5%	92.3%	7.8%
Unclassified Fallow	20	18	5.0%	90.0%	4.5%
Total Weighted Accuracy by Region					**98.9%**

Table 11. WY 2022 San Joaquin River Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	201	198	5.5%	98.5%	5.4%
Almonds	984	983	30.6%	99.9%	30.5%
Cherries	69	65	1.2%	94.2%	1.1%
Corn, Sorghum, and Sudan	365	358	11.7%	98.1%	11.4%
Cotton	82	82	2.2%	100.0%	2.2%
Grapes	132	132	8.8%	100.0%	8.8%
Melons, Squash, and Cucumbers	26	25	0.9%	96.2%	0.8%
Miscellaneous Grain and Hay	318	308	13.5%	96.9%	13.1%
Miscellaneous Grasses	17	8	0.6%	47.1%	0.3%
Miscellaneous Truck Crops	13	12	0.4%	92.3%	0.4%
Mixed Pasture	144	142	4.0%	98.6%	3.9%
Olives	10	10	0.4%	100.0%	0.4%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Peaches and Nectarines	16	16	0.3%	100.0%	0.3%
Pistachios	64	62	4.6%	96.9%	4.4%
Sweet Potatoes	47	46	0.8%	97.9%	0.8%
Tomatoes	115	109	3.3%	94.8%	3.1%
Unclassified Fallow	155	149	3.4%	96.1%	3.3%
Walnuts	198	198	5.6%	100.0%	5.6%
Young Perennial	49	42	2.4%	85.7%	2.0%
Total Weighted Accuracy by Region					**97.9%**

Table 12. WY 2022 South Coast Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Avocados	472	470	22.9%	99.6%	22.8%
Bush Berries	52	50	2.8%	96.2%	2.7%
Citrus	195	181	21.6%	92.8%	20.1%
Cole Crops	11	9	3.4%	81.8%	2.8%
Flowers, Nursery, and Christmas Tree Farms	57	57	6.9%	100.0%	6.9%
Miscellaneous Grain and Hay	14	11	8.0%	78.6%	6.3%
Miscellaneous Subtropical Fruits	14	6	0.7%	42.9%	0.3%
Miscellaneous Truck Crops	99	81	16.1%	81.8%	13.1%
Strawberries	54	54	6.3%	100.0%	6.3%
Unclassified Fallow	79	78	11.4%	98.7%	11.3%
Total Weighted Accuracy by Region					**92.5%**

Table 13. WY 2022 South Lahontan Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass[1]	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	27	27	36.8%	100.0%	36.8%
Miscellaneous Grain and Hay	12	12	9.3%	100.0%	9.3%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Mixed Pasture	50	46	42.7%	92.0%	39.3%
Unclassified Fallow	22	22	11.2%	100.0%	11.2%
Total Weighted Accuracy by Region					**96.6%**

[1] A high proportion of mixed forage crops exist in this region that commonly can be confused and impact accuracy.

Table 14. WY 2022 Tulare Lake Hydrologic Region Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	123	123	3.8%	100.0%	3.8%
Almonds	653	653	21.2%	100.0%	21.2%
Carrots	10	10	0.9%	100.0%	0.9%
Cherries	16	16	0.4%	100.0%	0.4%
Citrus	112	110	8.3%	98.2%	8.1%
Corn, Sorghum, and Sudan	342	338	8.7%	98.8%	8.6%
Cotton	53	52	2.8%	98.1%	2.7%
Grapes	307	306	8.9%	99.7%	8.8%
Melons, Squash, and Cucumber	10	10	0.5%	100.0%	0.5%
Miscellaneous Grain and Hay	265	259	11.0%	97.7%	10.7%
Miscellaneous Truck Crops	35	34	0.7%	97.1%	0.6%
Mixed Pasture	34	33	0.6%	97.1%	0.6%
Onions and Garlic	26	25	1.0%	96.2%	0.9%
Peaches and Nectarines	53	53	1.6%	100.0%	1.6%
Pistachios	290	290	14.8%	100.0%	14.8%
Plums	25	25	0.6%	100.0%	0.6%
Pomegranates	17	16	0.6%	94.1%	0.6%
Potatoes	15	15	0.6%	100.0%	0.6%
Tomatoes	58	58	2.9%	100.0%	2.9%
Unclassified Fallow	322	314	5.9%	97.5%	5.8%
Walnuts	102	101	2.3%	99.0%	2.3%

DWR Crop Class	Ground Truth Count	Classified Count	Weight	Unweighted Accuracy	Weighted Accuracy
Young Perennial	47	37	2.1%	78.7%	1.6%
Total Weighted Accuracy by Region					**98.7%**

PRECISION BY CROP

Two-tailed confidence intervals (95%) were calculated using the method in Olofsson et al. (2014) for the commission error of each crop class and are shown in Table 20. As noted above, precision is related to the random error, which can be quantified by a confidence interval. A confidence interval gives a range that encompasses the true value of an unknown fixed quantity with a specified probability. A precise estimate would thus have a small confidence interval. For example, citrus were mapped at 99% accuracy with a confidence interval of plus or minus 1%. This means that 99% of the time, we are confident that the citrus classification was between 97 and 99% correct.

As Table 20 shows, 12 crops were mapped with 100% accuracy and 0% confidence interval (100% confidence or precision). Table 20 also shows that the number of ground truth points directly influences the level of precision. As the number of ground truth points increases, precision (confidence) generally also increases, and the confidence interval becomes smaller. Some crops are mapped with high accuracy with few ground truth points because they are very distinct and relatively easy to distinguish from other crops. Other crops have a lower accuracy but relatively high precision (miscellaneous grasses) because the number of ground truth points was relatively high. Some crops were mapped with high accuracy but lower precision because of very few ground truth points.

Table 15. WY 2022 Statewide Land Use Mapping Accuracy and Precision by Crop

Crop Class	User's Accuracy (area correctly classified/total area classified)	Total validation area (counts)	95% Two-tailed Confidence Interval
Alfalfa and Alfalfa Mixtures	95%	1,009	1%
Almonds	100%	2,070	0%
Apricots	94%	16	12%
Avocados	96%	529	2%
Beans (Dry)	83%	25	22%
Bush Berries	98%	102	3%
Carrots	100%	47	0%
Cherries	98%	100	3%
Citrus	99%	366	1%
Cole Crops	87%	426	3%
Corn, Sorghum, and Sudan	98%	846	1%
Cotton	98%	162	2%
Dates	99%	79	3%
Flowers, Nursery, and Christmas Tree Farms	93%	176	4%

Crop Class	User's Accuracy (area correctly classified/total area classified)	Total validation area (counts)	95% Two-tailed Confidence Interval
Grapes	100%	1,002	0%
Lettuce or Leafy Greens	89%	389	3%
Melons, Squash and Cucumbers	94%	78	5%
Miscellaneous Deciduous	100%	22	0%
Miscellaneous Grain and Hay	98%	1,093	1%
Miscellaneous Grasses	88%	300	4%
Miscellaneous Subtropical Fruits	100%	22	0%
Miscellaneous Truck Crops	92%	383	3%
Mixed Pasture	96%	580	2%
Olives	98%	82	3%
Onions and Garlic	92%	83	6%
Peaches and Nectarines	99%	132	2%
Pears	98%	50	4%
Pecans	100%	11	0%
Peppers	100%	33	0%
Pistachios	99%	382	1%
Plums	93%	25	10%
Pomegranates	100%	23	0%
Potatoes	97%	33	6%
Prunes	99%	137	1%
Rice	100%	152	0%
Safflower	96%	25	9%
Strawberries	97%	225	2%
Sugar Beets	100%	38	0%
Sunflowers	96%	50	5%
Sweet Potatoes	98%	49	4%
Tomatoes	97%	291	2%
Turf	100%	16	0%
Unclassified Fallow	94%	1,431	1%
Walnuts	100%	782	0%
Young Perennials	97%	132	3%

Table 16. Statewide Land Use Mapping Validation Data Error Matrix by DWR Class Legend Level (count)

		Predicted													
		Citrus and Subtropical	Deciduous Fruits and Nuts	Field Crops	Grain and Hay crops	Pasture	Rice	Truck, Nursery, and Berry Crops	Unclassified	Vineyard	Young Perennial	**Reference Total**	**Omission Error**	**Producers Accuracy**	**Kappa Coefficient**
Reference	Citrus and Subtropical	1,081	1	0	0	0	0	3	1	0	2	1,088	1%	99%	
	Deciduous Fruits and Nuts	0	3,754	0	0	0	0	1	3	0	1	3,759	0%	100%	
	Field Crops	0	0	1,110	3	11	0	24	5	0	0	1,153	4%	96%	
	Grain and Hay crops	0	0	1	1,020	16	0	19	37	0	0	1,093	7%	93%	
	Pasture	0	1	13	8	1,877	0	1	5	0	0	1,905	1%	99%	
	Rice	0	0	0	0	0	152	0	0	0	0	152	0%	100%	
	Truck, Nursery, and Berry Crops	0	0	8	4	2	0	2,294	7	0	0	2,315	1%	99%	
	Unclassified	1	6	0	12	8	0	7	1,397	0	0	1,431	2%	98%	
	Vineyard	1	1	0	0	0	0	0	1	999	0	1,002	0%	100%	
	Young Perennial	1	2	0	0	0	0	0	24	0	105	132	20%	80%	
	Predicted Total	1,084	3,765	1,132	1,047	1,914	152	2,349	1,480	999	108	14,030			
	Commission Error	0%	0%	2%	3%	2%	0%	2%	6%	0%	3%				
	Users Accuracy	100%	100%	98%	97%	98%	100%	98%	94%	100%	97%				
	Kappa Coefficient														0.98

Table 17. Statewide Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference \ Predicted	Alfalfa and Alfalfa Mixtures	Almonds	Apricots	Avocados	Beans (dry)	Bushberries	Carrots	Cherries	Citrus	Cole crops	Corn, Sorghum, and Sudan	Cotton	Dates	Flowers, Nursery, and Christmas Tree Farms	Grapes	Lettuce or Leafy Greens	Melons, Squash, and Cucumbers	Miscellaneous Deciduous	Miscellaneous Grain and Hay	Miscellaneous Grasses	Miscellaneous Subtropical Fruits	Miscellaneous Truck Crops	Mixed Pasture	Olives	Onions and Garlic	Peaches and Nectarines	Pears	Pecans	Peppers	Pistachios	Plums	Pomegranates	Potatoes	Prunes	Rice	Safflower	Strawberries	Sugar beets	Sunflowers	Sweet Potatoes	Tomatoes	Turf	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	991	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	1	11	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,009	2%	98%	
Almonds	0	2,067	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2,070	0%	100%	
Apricots	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	16	6%	94%	
Avocados	0	0	0	526	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	529	1%	99%	
Beans (dry)	0	0	0	0	10	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	25	60%	40%	
Bushberries	0	0	0	0	0	99	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	102	3%	97%	
Carrots	0	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0%	100%	
Cherries	0	1	1	0	0	0	0	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	100	4%	96%	
Citrus	0	0	0	12	0	0	0	1	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	366	4%	96%	
Cole crops	0	0	0	0	0	1	0	0	0	402	0	0	0	0	0	20	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	426	6%	94%	
Corn, Sorghum, and Sudan	2	0	0	0	1	0	0	0	0	0	825	0	0	0	0	0	1	0	2	7	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	846	2%	98%	
Cotton	0	0	0	0	0	0	0	0	0	0	0	161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	162	1%	99%	
Dates	0	0	0	0	0	0	0	0	0	0	0	0	77	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	79	3%	97%	
Flowers, Nursery, and Christmas Tree Farms	0	0	0	0	1	0	0	0	0	1	0	0	0	172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	176	2%	98%	
Grapes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	999	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1,002	0%	100%	
Lettuce or Leafy Greens	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	381	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	389	2%	98%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	78	6%	94%	
Miscellaneous Deciduous	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	5%	95%	
Miscellaneous Grain and Hay	4	0	0	0	0	0	0	0	0	3	1	0	0	0	0	2	0	0	1,020	7	0	9	5	0	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	37	0	0	1,093	7%	93%	
Miscellaneous Grasses	40	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	5	232	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	300	23%	77%	
Miscellaneous Subtropical Fruits	0	0	0	10	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	59%	41%	
Miscellaneous Truck Crops	0	0	0	0	0	0	0	0	0	47	0	0	0	4	0	24	0	0	3	0	0	297	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	2	383	22%	78%	
Mixed Pasture	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	0	0	565	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	580	3%	97%	
Olives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	0%	100%	
Onions and Garlic	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	83	2%	98%	
Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132	0%	100%	
Pears	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0%	100%	
Pecans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0%	100%	
Peppers	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	33	12%	88%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	380	0	0	0	0	0	0	0	0	0	0	0	2	0	0	382	1%	99%	
Plums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0%	100%	
Pomegranates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	22	0	0	0	0	0	0	0	0	0	0	0	0	23	4%	96%	
Potatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	33	0%	100%	
Prunes	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	0	0	0	0	0	0	0	0	0	0	137	1%	99%	
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	0	0	0	0	0	0	0	0	0	152	0%	100%	
Safflower	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	3	0	0	25	12%	88%	
Strawberries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	223	0	0	0	0	1	0	0	225	1%	99%	
Sugar beets	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	38	3%	97%	
Sunflowers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	2	0	0	0	50	4%	96%	
Sweet Potatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	0	49	2%	98%	
Tomatoes	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	282	0	0	291	3%	97%	
Turf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	16	0%	100%	
Unclassified Fallow	2	2	0	0	0	1	0	1	0	0	0	0	1	6	0	0	0	0	12	0	0	0	6	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1,397	1	0	1,431	2%	98%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	780	0	782	0%	100%	
Young Perennials	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	24	0	105	132	20%	80%	
Predicted Total	1,042	2,072	16	549	12	101	47	98	354	464	843	164	78	185	999	430	78	21	1,046	263	9	322	591	84	88	134	51	11	29	384	27	22	34	137	152	23	231	37	50	49	290	16	1,480	783	108	14,004			
Comission Error	5%	0%	6%	4%	17%	2%	0%	2%	1%	13%	2%	2%	1%	7%	0%	11%	6%	0%	2%	12%	0%	8%	4%	2%	8%	1%	2%	0%	0%	1%	7%	0%	3%	1%	0%	4%	3%	0%	4%	2%	3%	0%	6%	0%	3%			
Users Accuracy	95%	100%	94%	96%	83%	98%	100%	98%	99%	87%	98%	98%	99%	93%	100%	89%	94%	100%	98%	88%	100%	92%	96%	98%	92%	99%	98%	100%	100%	99%	93%	100%	97%	99%	100%	96%	97%	100%	96%	98%	97%	100%	94%	100%	97%			
Kappa Coefficient																																															0.96

Table 18. Central Coast Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference	Predicted: Avocados	Bushberries	Cole Crops	Flowers, Nursery, and Christmas Tree Farms	Grapes	Lettuce or Leafy Greens	Miscellaneous Grain and Hay	Miscellaneous Truck Crops	Mixed Pasture	Onions and Garlic	Strawberries	Unclassified Fallow	Walnuts	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Avocados	56	0	0	1	0	0	0	0	0	0	0	0	0	57	2%	98%	
Bushberries	0	40	0	0	0	0	0	0	0	0	1	0	0	41	2%	98%	
Cole Crops	0	0	345	0	0	16	0	0	0	1	0	0	0	362	5%	95%	
Flowers, Nursery, and Christmas Tree Farms	0	0	1	88	0	0	0	0	0	0	1	0	0	90	2%	98%	
Grapes	0	0	0	0	114	0	0	0	0	0	0	1	0	115	1%	99%	
Lettuce or Leafy Greens	0	0	4	0	0	299	1	0	0	1	0	0	0	305	2%	98%	
Miscellaneous Grain and Hay	0	0	1	0	0	2	45	9	0	0	0	2	0	59	24%	76%	
Miscellaneous Truck Crops	0	0	29	0	0	19	3	138	0	0	0	1	0	190	27%	73%	
Mixed Pasture	0	0	0	0	0	0	0	0	22	0	0	0	0	22	0%	100%	
Onions and Garlic	0	0	1	0	0	0	0	0	0	9	0	0	0	10	10%	90%	
Strawberries	0	0	0	0	0	1	0	0	0	0	160	0	0	161	1%	99%	
Unclassified Fallow	0	0	0	2	0	0	0	0	0	0	0	87	0	89	2%	98%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	32	32	0%	100%	
Predicted Total	56	40	381	91	114	337	49	147	22	11	162	91	32	1,533			
Commission Error	0%	0%	9%	3%	0%	11%	8%	6%	0%	18%	1%	4%	0%				
Users Accuracy	100%	100%	91%	97%	100%	89%	92%	94%	100%	82%	99%	96%	100%				
Kappa Coefficient																	0.93

Table 19. Colorado River Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference \ Predicted	Alfalfa and Alfalfa Mixtures	Carrots	Citrus	Cole Crops	Corn, Sorghum, and Sudan	Cotton	Dates	Flowers, Nursery, and Christmas Tree Farms	Grapes	Lettuce or Leafy Greens	Melons, Squash, and Cucumbers	Miscellaneous Grain and Hay	Miscellaneous Grasses	Miscellaneous Truck Crops	Mixed Pasture	Onions and Garlic	Peppers	Sugar Beets	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	363	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	367	1%	99%	
Carrots	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0%	100%	
Citrus	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0%	100%	
Cole Crops	0	0	0	47	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	51	8%	92%	
Corn, Sorghum, and Sudan	0	0	0	0	67	0	0	0	0	0	0	2	1	1	0	0	0	0	0	71	6%	94%	
Cotton	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0%	100%	
Dates	0	0	0	0	0	0	77	0	0	0	0	0	0	1	0	0	0	0	1	79	3%	97%	
Flowers, Nursery, and Christmas Tree Farms	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	12	0%	100%	
Grapes	0	0	0	0	0	0	0	0	49	0	0	0	0	0	0	0	0	0	0	49	0%	100%	
Lettuce or Leafy Greens	0	0	0	1	0	0	0	0	0	76	0	0	0	0	0	0	0	0	1	78	3%	97%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	14	0%	100%	
Miscellaneous Grain and Hay	1	0	0	0	1	0	0	0	0	0	0	113	1	0	0	0	0	0	0	116	3%	97%	
Miscellaneous Grasses	4	0	0	0	1	0	0	0	0	0	0	0	147	0	0	0	0	0	0	152	3%	97%	
Miscellaneous Truck Crops	0	0	0	5	0	0	0	3	0	2	0	0	0	26	0	0	0	0	1	37	30%	70%	
Mixed Pasture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	18	0%	100%	
Onions and Garlic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	40	0%	100%	
Peppers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11	0%	100%	
Sugar Beets	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	37	3%	97%	
Unclassified Fallow	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	128	131	2%	98%	
Predicted Total	370	29	48	54	70	27	78	15	49	81	15	115	152	28	18	40	11	36	131	1,367			
Commission Error	2%	0%	0%	13%	4%	0%	1%	20%	0%	6%	7%	2%	3%	7%	0%	0%	0%	0%	2%				
Users Accuracy	98%	100%	100%	87%	96%	100%	99%	80%	100%	94%	93%	98%	97%	93%	100%	100%	100%	100%	98%				
Kappa Coefficient																							0.97

Table 20. North Coast Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference \ Predicted	Alfalfa and Alfalfa Mixtures	Grapes	Miscellaneous Grain and Hay	Miscellaneous Grasses	Mixed Pasture	Potatoes	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	99	0	0	2	0	0	0	101	2%	98%	
Grapes	0	124	0	0	0	0	0	124	0%	100%	
Miscellaneous Grain and Hay	1	0	46	0	1	1	8	57	19%	81%	
Miscellaneous Grasses	11	0	0	15	0	0	0	26	42%	58%	
Mixed Pasture	1	0	0	0	63	0	0	64	2%	98%	
Potatoes	0	0	0	0	0	15	0	15	0%	100%	
Unclassified Fallow	0	0	0	0	0	0	57	57	0%	100%	
Predicted Total	112	124	46	17	64	16	65	444			
Comission Error	12%	0%	0%	12%	2%	6%	12%				
Users Accuracy	88%	100%	100%	88%	98%	94%	88%				
Kappa Coefficient											0.93

Table 21. North Lahontan Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference		Predicted								
		Alfalfa and Alfalfa Mixtures	Miscellaneous Grain and Hay	Miscellaneous Grasses	Mixed Pasture	Unclassified Fallow	**Reference Total**	**Omission Error**	**Producers Accuracy**	**Kappa Coefficient**
	Alfalfa and Alfalfa Mixtures	52	1	1	0	0	54	4%	96%	
	Miscellaneous Grain and Hay	0	43	2	3	2	50	14%	86%	
	Miscellaneous Grasses	5	0	24	7	0	36	33%	67%	
	Mixed Pasture	0	0	2	46	2	50	8%	92%	
	Unclassified Fallow	0	2	0	1	24	27	11%	89%	
	Predicted Total	57	46	29	57	28	217			
	Commission Error	9%	7%	17%	19%	14%				
	Users Accuracy	91%	93%	83%	81%	86%				
	Kappa Coefficient									0.84

Table 22. Sacramento River Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference	Predicted: Alfalfa and Alfalfa Mixtures	Almonds	Corn, Sorghum, and Sudan	Grapes	Melons, Squash, and Cucumbers	Miscellaneous Deciduous	Miscellaneous Grain and Hay	Miscellaneous Grasses	Mixed Pasture	Olives	Peaches and Nectarines	Pears	Pistachios	Prunes	Rice	Safflower	Sunflowers	Tomatoes	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	120	0	1	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	126	5%	95%	
Almonds	0	431	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	433	0%	100%	
Corn, Sorghum, and Sudan	0	0	52	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	54	4%	96%	
Grapes	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	111	1%	99%	
Melons, Squash, and Cucumbers	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	20	10%	90%	
Miscellaneous Deciduous	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0%	100%	
Miscellaneous Grain and Hay	1	0	0	0	0	0	168	1	1	0	0	0	0	0	0	0	0	0	13	0	0	184	9%	91%	
Miscellaneous Grasses	14	0	4	0	0	0	4	35	2	0	0	0	0	0	0	0	0	0	1	0	0	60	42%	58%	
Mixed Pasture	0	0	0	0	0	0	1	1	176	0	0	0	0	0	0	0	0	0	0	0	0	178	1%	99%	
Olives	0	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0	0	0	0	0	0	63	0%	100%	
Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	56	0	0	0	0	0	0	0	0	0	0	56	0%	100%	
Pears	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	50	0%	100%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	28	0%	100%	
Prunes	0	1	0	0	0	0	0	0	0	0	0	0	0	134	0	0	0	0	0	0	0	135	1%	99%	
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144	0	0	0	0	0	0	144	0%	100%	
Safflower	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	3	0	0	13	23%	77%	
Sunflowers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	2	0	0	0	50	4%	96%	
Tomatoes	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	107	0	0	0	109	2%	98%	
Unclassified Fallow	0	2	0	0	0	0	2	0	2	0	0	0	1	0	0	0	0	0	520	1	0	528	2%	98%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	449	0	450	0%	100%	
Young Perennials	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	21	24	12%	88%	
Predicted Total	135	434	57	110	19	10	175	42	182	63	56	51	29	135	144	11	50	110	539	452	22	2,826			
Commission Error	11%	1%	9%	0%	5%	0%	4%	17%	3%	0%	0%	2%	3%	1%	0%	9%	4%	3%	4%	1%	5%				
Users Accuracy	89%	99%	91%	100%	95%	100%	96%	83%	97%	100%	100%	98%	97%	99%	100%	91%	96%	97%	96%	99%	95%				
Kappa Coefficient																									0.97

Table 23. San Francisco Bay Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference		Predicted							
		Grapes	Miscellaneous Grain and Hay	Mixed Pasture	Unclassified Fallow	**Reference Total**	**Omission Error**	**Producers Accuracy**	**Kappa Coefficient**
	Grapes	156	0	0	0	156	0%	100%	
	Miscellaneous Grain and Hay	0	15	0	0	15	0%	100%	
	Mixed Pasture	0	1	12	0	13	8%	92%	
	Unclassified Fallow	0	2	0	18	20	10%	90%	
	Predicted Total	156	18	12	18	204			
	Commission Error	0%	17%	0%	0%				
	Users Accuracy	100%	83%	100%	100%				
	Kappa Coefficient								0.96

Table 24. San Joaquin River Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference	Alfalfa and Alfalfa Mixtures	Almonds	Cherries	Corn, Sorghum, and Sudan	Cotton	Grapes	Melons, Squash, and Cucumbers	Miscellaneous Grain and Hay	Miscellaneous Grasses	Miscellaneous Truck Crops	Mixed Pasture	Olives	Peaches and Nectarines	Pistachios	Sweet Potatoes	Tomatoes	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
	Predicted																						
Alfalfa and Alfalfa Mixtures	198	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	201	1%	99%	
Almonds	0	983	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	984	0%	100%	
Cherries	0	1	65	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	67	3%	97%	
Corn, Sorghum, and Sudan	2	0	0	358	0	0	1	0	1	1	0	0	0	0	0	1	0	0	0	364	2%	98%	
Cotton	0	0	0	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	0%	100%	
Grapes	0	0	0	0	0	132	0	0	0	0	0	0	0	0	0	0	0	0	0	132	0%	100%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	1	0	0	26	4%	96%	
Miscellaneous Grain and Hay	1	0	0	0	0	0	0	308	1	0	0	0	0	0	0	0	7	0	0	317	3%	97%	
Miscellaneous Grasses	2	0	0	4	0	0	0	0	8	0	3	0	0	0	0	0	0	0	0	17	53%	47%	
Miscellaneous Truck Crops	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12	0%	100%	
Mixed Pasture	2	0	0	0	0	0	0	0	0	0	142	0	0	0	0	0	0	0	0	144	1%	99%	
Olives	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	10	0%	100%	
Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	16	0%	100%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	0	62	0	0	2	0	0	64	3%	97%	
Sweet Potatoes	0	0	0	0	0	0	1	0	0	0	0	0	0	0	46	0	0	0	0	47	2%	98%	
Tomatoes	0	0	0	2	3	0	0	0	0	0	0	0	0	0	1	109	0	0	0	115	5%	95%	
Unclassified Fallow	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	149	0	0	154	3%	97%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198	0	198	0%	100%	
Young Perennials	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	42	49	14%	86%	
Predicted Total	205	985	65	366	85	132	27	312	10	13	147	10	17	63	47	110	165	198	42	2,999			
Commission Error	3%	0%	0%	2%	4%	0%	7%	1%	20%	8%	3%	0%	6%	2%	2%	1%	10%	0%	0%				
Users Accuracy	97%	100%	100%	98%	96%	100%	93%	99%	80%	92%	97%	100%	94%	98%	98%	99%	90%	100%	100%				
Kappa Coefficient																							0.98

Table 25. South Coast Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference	Avocados	Bushberries	Citrus	Cole Crops	Flowers, Nursery, and Christmas Tree Farms	Miscellaneous Grain and Hay	MiscellaneousSsubtropicals	Miscellaneous Truck Crops	Strawberries	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Avocados	470	0	2	0	0	0	0	0	0	0	472	0%	100%	
Bushberries	0	50	0	0	1	0	0	0	1	0	52	4%	96%	
Citrus	12	0	181	0	0	0	0	0	0	0	193	6%	94%	
Cole Crops	0	1	0	9	0	0	0	0	0	0	10	10%	90%	
Flowers, Nursery, and Christmas Tree Farms	0	0	0	0	57	0	0	0	0	0	57	0%	100%	
Miscellaneous Grain and Hay	0	0	0	2	0	11	0	0	0	0	13	15%	85%	
MiscellaneousSsubtropicals	7	0	1	0	0	0	6	0	0	0	14	57%	43%	
Miscelllaneous Truck Crops	0	0	0	13	1	0	0	81	1	0	96	16%	84%	
Strawberries	0	0	0	0	0	0	0	0	54	0	54	0%	100%	
Unclassified Fallow	0	1	0	0	0	0	0	0	0	78	79	1%	99%	
Predicted Total	489	52	184	24	59	11	6	81	56	78	1,040			
Commission Error	4%	4%	2%	62%	3%	0%	0%	0%	4%	0%				
Users Accuracy	96%	96%	98%	38%	97%	100%	100%	100%	96%	100%				
Kappa Coefficient														0.94

Table 26. South Lahontan Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference	Predicted: Alfalfa and Alfalfa Mixtures	Miscellaneous Grain and Hay	Mixed Pasture	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	27	0	0	0	27	0%	100%	
Miscellaneous Grain and Hay	0	12	0	0	12	0%	100%	
Mixed Pasture	0	0	46	2	48	4%	96%	
Unclassified Fallow	0	0	0	22	22	0%	100%	
Predicted Total	27	12	46	24	109			
Commission Error	0%	0%	0%	8%				
Users Accuracy	100%	100%	100%	92%				
Kappa Coefficient								0.97

Table 27. Tulare Lake Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (count)

Reference	Alfalfa and Alfalfa Mixtures	Almonds	Carrots	Cherries	Citrus	Corn, Sorghum, and Sudan	Cotton	Grapes	Melons, Squash, and Cucumbers	Miscellaneous Grain and Hay	Miscellaneous Truck Crops	Mixed Pasture	Onions and Garlic	Peaches/nectarines	Pistachios	Plums	Pomegranates	Potatoes	Tomatoes	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Predicted																										
Alfalfa and Alfalfa Mixtures	123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	123	0%	100%	
Almonds	0	653	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	653	0%	100%	
Carrots	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0%	100%	
Cherries	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0%	100%	
Citrus	0	0	0	1	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	112	2%	98%	
Corn, Sorghum, and Sudan	0	0	0	0	0	338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	338	0%	100%	
Cotton	0	0	0	0	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	53	2%	98%	
Grapes	0	0	0	0	0	0	0	306	0	0	0	0	0	0	0	0	0	0	0	0	0	0	306	0%	100%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0%	100%	
Miscellaneous Grain and Hay	0	0	0	0	0	0	0	0	0	259	0	0	0	0	0	0	0	0	0	5	0	0	264	2%	98%	
Miscellaneous Truck Crops	0	0	0	0	0	0	0	0	0	0	34	0	1	0	0	0	0	0	0	0	0	0	35	3%	97%	
Mixed Pasture	0	0	0	0	0	0	0	0	0	0	0	33	0	0	1	0	0	0	0	0	0	0	34	3%	97%	
Onions and Garlic	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	1	0	0	26	4%	96%	
Peaches/nectarines	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	0	0	0	53	0%	100%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	0	0	290	0	0	0	0	0	0	0	290	0%	100%	
Plums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	25	0%	100%	
Pomegranates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	16	0	0	0	0	0	17	6%	94%	
Potatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	15	0%	100%	
Tomatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	0	0	0	58	0%	100%	
Unclassified Fallow	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	0	0	0	0	314	0	0	319	2%	98%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	101	0	102	1%	99%	
Young Perennials	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	37	47	21%	79%	
Predicted Total	123	653	10	17	110	338	52	306	10	261	34	35	26	54	292	25	16	15	58	332	101	38	2,906			
CommissionEerror	0%	0%	0%	6%	0%	0%	0%	0%	0%	1%	0%	6%	4%	2%	1%	0%	0%	0%	0%	5%	0%	3%				
Users Accuracy	100%	100%	100%	94%	100%	100%	100%	100%	100%	99%	100%	94%	96%	98%	99%	100%	100%	100%	100%	95%	100%	97%				
Kappa Coefficient																										0.99

Accuracy Assessment by Area (Acres)

Weighted Accuracy by Crop Class

Table 28. WY 2022 Statewide Land Use Mapping Weighted Accuracy by DWR Crop Class Legend Level

DWR Crop Class	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Citrus and Subtropical	12,154	12,133	5%	100%	5%
Deciduous Fruits and Nuts	141,678	141,357	29%	100%	29%
Field Crops	58,279	56,293	9%	97%	9%
Grain and Hay	48,691	45,773	11%	94%	10%
Pasture	89,058	88,322	16%	99%	15%
Rice	8,244	8,244	3%	100%	3%
Truck, Nursery and Berry Crops	63,373	62,637	12%	99%	12%
Unclassified	66,133	65,234	7%	99%	7%
Vineyard	22,594	22,551	8%	100%	8%
Young Perennials	3,897	3,155	1%	81%	1%
Total Weighted Accuracy Statewide				**98%**	**98%**

Table 29. WY 2022 Statewide Land Use Mapping Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	54,889	54,290	6%	99%	6%
Almonds	85,055	84,815	16%	100%	16%
Apricots	162	155	0%	96%	0%
Avocados	2,906	2,888	1%	99%	1%
Beans (Dry)	1,295	524	0%	40%	0%
Bush Berries	818	785	0%	96%	0%
Carrots	2,387	2,387	1%	100%	1%
Cherries	1,899	1,844	0%	97%	0%
Citrus	6,231	6,163	3%	99%	3%
Cole Crops	9,436	8,789	2%	93%	2%
Corn, Sorghum and Sudan	39,555	38,810	6%	98%	6%

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Cotton	8,468	8,393	1%	99%	1%
Dates	1,006	1,003	0%	100%	0%
Flowers, Nursery and Christmas Tree Farms	1,076	996	0%	93%	0%
Grapes	22,594	22,551	8%	100%	8%
Lettuce/Leafy Greens	9,032	8,839	3%	98%	3%
Melons, Squash and Cucumbers	2,975	2,865	1%	96%	1%
Miscellaneous Deciduous	162	153	0%	94%	0%
Miscellaneous Grain and Hay	48,691	45,773	11%	94%	10%
Miscellaneous Grasses	15,310	12,552	2%	82%	2%
Miscellaneous Subtropical Fruits	63	32	0%	50%	0%
Miscellaneous Truck Crops	7,531	5,718	2%	76%	1%
Mixed Pasture	18,461	18,220	7%	99%	7%
Olives	1,833	1,833	1%	100%	1%
Onions and Garlic	4,658	4,637	1%	100%	1%
Peaches/Nectarines	1,871	1,871	1%	100%	1%
Pears	857	857	0%	100%	0%
Pecans	110	110	0%	100%	0%
Peppers	891	822	0%	92%	0%
Pistachios	24,596	24,480	6%	100%	6%
Plums	228	228	0%	100%	0%
Pomegranates	723	722	0%	100%	0%
Potatoes	2,237	2,237	0%	100%	0%
Prunes	3,499	3,497	0%	100%	0%
Rice	8,244	8,244	3%	100%	3%
Safflower	2,397	2,297	1%	96%	1%
Strawberries	3,532	3,467	1%	98%	1%
Sugar Beets	3,221	3,003	0%	93%	0%

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Sunflowers	3,056	2,940	0%	96%	0%
Sweet Potatoes	1,271	1,263	0%	99%	0%
Tomatoes	17,528	17,014	2%	97%	2%
Turf Farms	398	398	0%	100%	0%
Unclassified Fallow	66,133	65,234	7%	99%	7%
Walnuts	22,352	22,344	5%	100%	5%
Young Perennials	3,897	3,155	1%	81%	1%
Total Weighted Accuracy Statewide				**97%**	**97%**

Table 30 .WY 2022 Central Coast Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Avocados	353	349	1.7%	99.0%	1.7%
Bush Berries	264	252	1.0%	95.4%	0.9%
Cole Crops	6,727	6,382	18.0%	94.9%	17.1%
Flowers, Nursery and Christmas Tree Farms	424	414	0.9%	97.7%	0.9%
Grapes	2,442	2,401	16.8%	98.3%	16.5%
Lettuce/Leafy Greens	6,281	6,159	28.9%	98.1%	28.3%
Miscellaneous Grain and Hay	1,109	890	7.4%	80.3%	5.9%
Miscellaneous Truck Crops	3,500	2,449	9.9%	70.0%	6.9%
Mixed Pasture	1,119	1,119	1.8%	100.0%	1.8%
Onions and Garlic	226	210	0.7%	92.9%	0.6%
Strawberries	2,166	2,130	6.3%	98.4%	6.2%
Unclassified Fallow	1,377	1,371	6.2%	99.6%	6.1%
Walnuts	559	559	0.6%	99.9%	0.6%
Total Weighted Accuracy					**93.6%**

Table 31. WY 2022 Colorado River Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	21,072	20,937	27.3%	99.4%	27.2%
Carrots	1,473	1,473	2.5%	100.0%	2.5%
Citrus	1,315	1,315	2.6%	100.0%	2.6%
Cole Crops	2,392	2,117	3.4%	88.5%	3.0%
Corn, Sorghum and Sudan	843	843	1.2%	100.0%	1.2%
Cotton	1,006	1,003	2.0%	99.7%	1.9%
Dates	61	61	0.3%	100.6%	0.3%
Grapes	777	777	0.7%	99.9%	0.7%
Lettuce/Leafy Greens	2,527	2,455	7.6%	97.1%	7.4%
Melons, Squash and Cucumbers	724	724	1.2%	100.0%	1.2%
Miscellaneous Grain and Hay	4,980	4,600	7.5%	92.4%	6.9%
Miscellaneous Grasses	10,350	10,034	14.4%	96.9%	14.0%
Miscellaneous Truck Crops	1,278	1,083	2.3%	84.7%	2.0%
Mixed Pasture	117	117	0.2%	99.8%	0.2%
Onions and Garlic	2,207	2,207	3.3%	100.0%	3.3%
Peppers	262	262	0.4%	99.8%	0.4%
Sugar Beets	3,189	2,971	3.6%	93.2%	3.4%
Unclassified Fallow	4,164	4,119	9.8%	98.9%	9.7%
Total Weighted Accuracy					**97.1%**

Table 32. WY 2022 North Coast Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	6,338	6,237	15.4%	98.4%	15.1%
Grapes	835	835	16.3%	100.0%	16.4%
Miscellaneous Grain and Hay	2,521	1,946	13.9%	77.2%	10.7%

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Miscellaneous Grasses	928	266	7.9%	28.7%	2.3%
Mixed Pasture	2,479	2,405	37.9%	97.0%	36.8%
Potatoes	1,024	1,024	1.4%	100.0%	1.4%
Unclassified Fallow	2,497	2,497	7.1%	100.0%	7.1%
Total Weighted Accuracy					**89.8%**

Table 33. WY 2022 North Lahontan Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	4,220	4,149	18.9%	98.3%	18.6%
Miscellaneous Grain and Hay	1,296	1,176	9.7%	90.7%	8.8%
Miscellaneous Grasses	1,130	713	10.4%	63.1%	6.6%
Mixed Pasture	1,978	1,945	58.5%	98.3%	57.5%
Unclassified Fallow	818	750	2.4%	91.6%	2.2%
Total Weighted Accuracy					**93.7%**

Table 34. WY 2022 Sacramento River Hydrologic Region Land Use Acreage Weighted Mapping Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	6,599	6,370	4.4%	96.5%	4.3%
Almonds	18,641	18,440	14.2%	98.9%	14.0%
Corn, Sorghum and Sudan	2,098	2,036	2.2%	97.1%	2.2%
Grapes	3,076	3,075	2.8%	100.0%	2.8%
Melons, Squash and Cucumbers	799	774	0.7%	96.9%	0.7%
Miscellaneous Deciduous	55	55	0.1%	100.6%	0.1%
Miscellaneous Grain and Hay	7,765	7,234	9.2%	93.2%	8.6%
Miscellaneous Grasses	2,128	1,276	2.2%	60.0%	1.3%

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Mixed Pasture	6,908	6,905	14.0%	100.0%	14.0%
Olives	1,260	1,260	1.4%	100.0%	1.4%
Peaches/Nectarines	581	581	0.5%	100.1%	0.5%
Pears	857	857	0.3%	100.0%	0.3%
Pistachios	1,867	1,867	0.9%	100.0%	0.9%
Prunes	3,478	3,477	1.9%	100.0%	1.9%
Rice	8,094	8,094	12.1%	100.0%	12.1%
Safflower	692	592	0.8%	85.5%	0.7%
Sunflowers	3,056	2,940	1.7%	96.2%	1.6%
Tomatoes	6,643	6,562	3.6%	98.8%	3.6%
Unclassified Fallow	24,003	23,755	13.5%	99.0%	13.3%
Walnuts	12,808	12,800	12.1%	99.9%	12.1%
Young Perennials	519	415	1.4%	79.9%	1.1%
Total Weighted Accuracy					**97.%**

Table 35. WY 2022 San Francisco Bay Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Grapes	1,274	1,274	58.3%	100.0%	58.3%
Miscellaneous Grain and Hay	637	637	28.3%	99.9%	28.3%
Mixed Pasture	34	34	8.5%	100.8%	8.5%
Unclassified Fallow	130	107	5.0%	82.6%	4.1%
Total Weighted Accuracy					99.2%

Table 36. WY 2022 San Joaquin River Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	6,909	6,851	5.5%	99.2%	5.4%
Almonds	32,935	32,897	30.6%	99.9%	30.5%
Cherries	1,285	1,230	1.2%	95.7%	1.1%
Corn, Sorghum and Sudan	13,969	13,683	11.7%	97.9%	11.4%
Cotton	3,127	3,127	2.2%	100.0%	2.2%
Grapes	5,181	5,181	8.8%	100.0%	8.8%
Melons, Squash and Cucumbers	912	838	0.9%	91.9%	0.8%
Miscellaneous Grain and Hay	11,704	11,468	13.5%	98.0%	13.3%
Miscellaneous Grasses	433	197	0.6%	45.5%	0.3%
Miscellaneous Truck Crops	216	215	0.4%	99.4%	0.4%
Mixed Pasture	2,490	2,485	4.0%	99.8%	3.9%
Peaches/Nectarines	308	308	0.4%	100.2%	0.4%
Pistachios	276	276	0.3%	99.9%	0.3%
Sweet Potatoes	3,626	3,509	4.6%	96.8%	4.4%
Tomatoes	1,117	1,110	0.8%	99.3%	0.8%
Unclassified Fallow	5,902	5,485	3.3%	92.9%	3.1%
Walnuts	4,381	4,231	3.4%	96.6%	3.3%
Young Perennials	6,128	6,128	5.6%	100.0%	5.6%
Total Weighted Accuracy					**97.9%**

Table 37. WY 2022 South Coast Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Avocados	2,553	2,539	22.9%	99.4%	22.7%
Bush Berries	414	394	2.8%	95.1%	2.6%

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Citrus	2,104	2,046	21.6%	97.2%	21.0%
Cole Crops	217	191	3.4%	87.8%	3.0%
Flowers, Nursery and Christmas Tree Farms	224	224	6.9%	99.8%	6.9%
Miscellaneous Grain and Hay	622	531	8.0%	85.4%	6.8%
Miscellaneous Subtropical Fruits	46	24	0.7%	52.0%	0.4%
Miscellaneous Truck Crops	2,061	1,577	16.1%	76.5%	12.3%
Strawberries	995	995	6.3%	100.0%	6.3%
Unclassified Fallow	1,110	1,109	11.4%	99.9%	11.4%
Total Weighted Accuracy					**93.4%**

Table 38. WY 2022 South Lahontan Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop Subclass	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixes	2,413	2,413	36.8%	100.0%	36.8%
Miscellaneous Grain and Hay	691	691	9.3%	100.0%	9.3%
Mixed Pasture	3,049	2,927	42.7%	96.0%	41.0%
Unclassified Fallow	1,625	1,625	11.2%	100.0%	11.2%
Total Weighted Accuracy					**98.3%**

Table 39. WY 2022 Tulare Lake Hydrologic Region Land Use Mapping Acreage Weighted Accuracy by Subclass Legend Level

Crop	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Alfalfa and Alfalfa Mixtures	7,262	7,262	3.8%	100.0%	3.8%
Almonds	33,479	33,479	21.2%	100.0%	21.2%
Carrots	716	716	0.9%	100.0%	0.9%
Cherries	405	405	0.4%	99.9%	0.4%
Citrus	2,628	2,618	8.3%	99.6%	8.2%

Crop	Ground Truth Area	Classified Area	Weight	Unweighted Accuracy	Weighted Accuracy
Corn, Sorghum and Sudan	19,097	18,948	8.7%	99.2%	8.6%
Cotton	4,498	4,424	2.8%	98.3%	2.7%
Grapes	8,975	8,974	8.9%	100.0%	8.8%
Melons, Squash and Cucumbers	376	376	0.5%	100.1%	0.5%
Miscellaneous Grain and Hay	17,366	16,599	11.0%	95.6%	10.5%
Miscellaneous Truck Crops	400	323	0.7%	80.7%	0.5%
Mixed Pasture	243	239	0.6%	98.4%	0.6%
Onions and Garlic	1,912	1,908	1.0%	99.8%	1.0%
Peaches/Nectarines	752	752	1.6%	100.0%	1.6%
Pistachios	19,103	19,103	14.8%	100.0%	14.8%
Plums	228	228	0.6%	100.0%	0.6%
Pomegranates	642	641	0.6%	99.8%	0.6%
Potatoes	997	997	0.6%	100.0%	0.6%
Tomatoes	4,732	4,732	2.9%	100.0%	2.9%
Unclassified Fallow	26,029	25,672	5.9%	98.6%	5.8%
Walnuts	2,857	2,857	2.3%	100.0%	2.3%
Young Perennials	1,840	1,583	2.1%	86.0%	1.8%
Total Weighted Accuracy					**98.9%**

PRECISION BY CROP

Table 40. Statewide Land Use Mapping Validation Data Error Matrix by DWR Class Legend Level (acres)

Reference \ Predicted	Citrus and Subtropical	Deciduous Fruits and Nuts	Field Crops	Grain and Hay Crops	Pasture	Rice	Truck, Nursery and Berry Crops	Unclassified Fallow	Vineyard	Young Perennial	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Citrus and Subtropical	12,133	1	0	0	0	0	7	1	0	13	12,154	0%	100%	
Deciduous Fruits and Nuts	0	141,357	0	0	0	0	9	117	0	195	141,678	0%	100%	
Field Crops	0	0	56,293	85	458	0	1,178	264	0	0	58,279	3%	97%	
Grain and Hay Crops	0	0	85	45,773	668	0	615	1,551	0	0	48,691	6%	94%	
Pasture	0	4	324	128	88,322	0	125	154	0	0	89,058	1%	99%	
Rice	0	0	0	0	0	8,244	0	0	0	0	8,244	0%	100%	
Truck, Nursery and Berry Crops	0	0	479	68	6	0	62,637	183	0	0	63,373	1%	99%	
Unclassified Fallow	5	220	0	378	241	0	55	65,234	0	0	66,133	1%	99%	
Vineyard	1	1	0	0	0	0	0	40	22,551	0	22,594	0%	100%	
Young Perennial	1	23	0	0	0	0	0	718	0	3,155	3,897	19%	81%	
Predicted Total	12,140	141,606	57,181	46,432	89,696	8,244	64,625	68,262	22,551	3,363	514,101			
Commission Error	0%	0%	2%	1%	2%	0%	3%	4%	0%	6%				
Users Accuracy	100%	100%	98%	99%	98%	100%	97%	96%	100%	94%				
Kappa Coefficient														0.98

Table 41. Statewide Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference \ Predicted	Alfalfa and Alfalfa mixtures	Almonds	Apricots	Avocados	Beans (dry)	Bushberries	Carrots	Cherries	Citrus	Cole Crops	Corn, Sorghum, and Sudan	Cotton	Dates	Flowers, Nursery, and Christmas Tree Farms	Grapes	Lettuce or Leafy greens	Melons, Squash, and Cucumbers	Miscellaneous Deciduous	Miscellaneous Grain and Hay	Miscellaneous Grasses	Miscellaneous Subtropical Fruits	Miscellaneous Truck Crops	Mixed Pasture	Olives	Onions and Garlic	Peaches and Nectarines	Pears	Pecans	Peppers	Pistachios	Plums	Pomegranates	Potatoes	Prunes	Rice	Safflower	Strawberries	Sugar Beets	Sunflowers	Sweet Potatoes	Tomatoes	Turf	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa mixtures	54,290	0	0	0	0	0	0	0	0	0	77	0	0	0	0	0	0	0	47	439	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54,889	1%	99%	
Almonds	0	84,815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	195	85,055	0%	100%	
Apricots	0	0	155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	4%	96%	
Avocados	0	0	0	2,888	0	0	0	0	14	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,906	1%	99%	
Beans (dry)	0	0	0	0	524	0	0	0	0	50	121	0	0	0	0	0	0	0	0	0	0	368	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	0	89	0	0	1,295	60%	40%	
Bushberries	0	0	0	0	0	785	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	818	4%	96%	
Carrots	0	0	0	0	0	0	2,387	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,387	0%	100%	
Cherries	0	30	1	0	0	0	0	1,844	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,899	3%	97%	
Citrus	0	0	0	53	0	0	0	1	6,163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	6,231	1%	99%	
Cole Crops	0	0	0	0	0	14	0	0	0	8,789	0	0	0	0	0	616	13	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,436	7%	93%	
Corn, Sorghum, and Sudan	59	0	0	0	105	0	0	0	0	0	38,810	0	0	0	0	0	85	0	27	255	0	141	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0	0	0	0	44	0	0	0	39,555	2%	98%	
Cotton	0	0	0	0	0	0	0	0	0	0	0	8,393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	8,468	1%	99%	
Dates	0	0	0	0	0	0	0	0	0	0	0	0	1,003	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1,006	0%	100%	
Flowers, Nursery, and Christmas Tree Farms	0	0	0	0	35	0	0	0	0	2	0	0	0	996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	35	0	0	1,076	7%	93%	
Grapes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22,551	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1	0	22,594	0%	100%	
Lettuce or Leafy greens	0	0	0	0	0	0	0	0	0	128	0	0	0	0	0	8,839	0	0	15	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	9,032	2%	98%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2,865	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	13	0	12	0	74	0	2,975	4%	96%	
Miscellaneous Deciduous	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162	6%	94%	
Miscellaneous Grain and Hay	195	0	0	0	0	0	0	0	0	83	85	0	0	0	0	56	0	0	45,773	345	0	148	128	0	218	0	0	0	0	0	0	0	109	0	0	0	0	0	0	0	0	1,551	0	0	48,691	6%	94%	
Miscellaneous Grasses	1,877	0	0	0	0	0	0	0	0	0	247	0	0	0	0	0	0	0	79	12,552	0	0	354	0	0	0	0	0	0	0	0	0	0	0	0	125	0	0	0	0	0	76	0	0	15,310	18%	82%	
Miscellaneous Subtropical Fruits	0	0	0	29	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	32	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	49%	51%	
Miscellaneous Truck Crops	0	0	0	0	0	0	0	0	0	1,146	0	0	0	21	0	479	0	0	53	0	0	5,718	3	0	77	0	0	0	0	0	0	0	0	0	8	0	0	0	20	0	7	0	0	7,531	24%	76%	
Mixed Pasture	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	78	0	0	18,220	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	78	0	0	18,461	1%	99%	
Olives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,833	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,833	0%	100%	
Onions and Garlic	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4,658	0%	100%	
Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,871	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,871	0%	100%	
Pears	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	857	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	857	0%	100%	
Pecans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110	0%	100%	
Peppers	0	0	0	0	0	0	0	0	0	39	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	822	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	891	8%	92%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24,480	0	0	0	0	0	0	0	0	0	0	0	117	0	0	24,596	0%	100%	
Plums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	228	0	0	0	0	0	0	0	0	0	0	0	0	0	228	0%	100%	
Pomegranates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	722	0	0	0	0	0	0	0	0	0	0	0	0	723	0%	100%	
Potatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,237	0	0	0	0	0	0	0	0	0	0	0	2,237	0%	100%	
Prunes	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,497	0	0	0	0	0	0	0	0	0	0	3,499	0%	100%	
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,244	0	0	0	0	0	0	0	0	0	8,244	0%	100%	
Safflower	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,297	0	0	0	0	0	100	0	0	2,397	4%	96%	
Strawberries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,467	0	0	0	0	29	0	0	3,532	2%	98%	
Sugar Beets	0	0	0	0	0	0	0	0	0	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,003	0	0	0	0	0	0	3,221	7%	93%	
Sunflowers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,940	0	115	0	0	0	3,056	4%	96%	
Sweet Potatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,263	0	0	0	0	1,271	1%	99%	
Tomatoes	0	0	0	0	0	0	0	0	0	0	96	288	0	0	0	17	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	34	17,014	0	0	0	17,528	3%	97%	
Turf	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	398	0	0	398	0%	100%	
Unclassified Fallow	41	82	0	0	0	2	0	1	0	0	0	0	5	53	0	0	0	0	378	0	0	0	200	0	0	82	0	0	0	52	0	0	0	0	0	0	0	0	0	0	0	0	65,234	2	0	66,133	1%	99%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22,344	0	22,352	0%	100%	
Young Perennials	0	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	718	0	3,155	3,897	19%	81%	
Predicted Total	56,540	84,936	156	2,971	663	801	2,387	1,847	6,179	10,471	39,436	8,681	1,008	1,087	22,551	10,046	3,024	153	46,375	13,672	32	6,378	18,941	1,837	4,950	1,976	865	110	822	24,575	236	722	2,347	3,514	8,244	2,325	3,644	3,003	3,001	1,297	17,356	398	68,262	22,353	3,363	513,535			
Commission Error	4%	0%	1%	3%	21%	2%	0%	0%	0%	16%	2%	3%	0%	8%	0%	12%	5%	0%	1%	8%	0%	10%	4%	0%	6%	5%	1%	0%	0%	0%	3%	0%	5%	0%	0%	1%	5%	0%	2%	3%	2%	0%	4%	0%	6%			
Users Accuracy	96%	100%	99%	97%	79%	98%	100%	100%	100%	84%	98%	97%	100%	92%	100%	88%	95%	100%	99%	92%	100%	90%	96%	100%	94%	95%	99%	100%	100%	100%	97%	100%	95%	100%	100%	99%	95%	100%	98%	97%	98%	100%	96%	100%	94%			
Kappa Coefficient																																															0.96

Table 42. Central Coast Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Avocados	Bushberries	Cole Crops	Flowers, Nursery, and Christmas Tree Farms	Grapes	Lettuce or Leafy Greens	Miscellaneous Grain and Hay	Miscellaneous Truck Crops	Mixed Pasture	Onions and Garlic	Strawberries	Unclassified Fallow	Walnuts	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
	Predicted																
Avocados	349	0	0	4	0	0	0	0	0	0	0	0	0	353	1%	99%	
Bushberries	0	252	0	0	0	0	0	0	0	0	13	0	0	264	5%	95%	
Cole Crops	0	0	6,382	0	0	340	0	0	0	2	0	0	0	6,724	5%	95%	
Flowers, Nursery, and Christmas Tree Farms	0	0	2	414	0	0	0	0	0	0	8	0	0	424	2%	98%	
Grapes	0	0	0	0	2,401	0	0	0	0	0	0	40	0	2,442	2%	98%	
Lettuce or Leafy Greens	0	0	91	0	0	6,159	15	0	0	16	0	0	0	6,281	2%	98%	
Miscellaneous Grain and Hay	0	0	3	0	0	56	890	148	0	0	0	11	0	1,109	20%	80%	
Miscellaneous Truck Crops	0	0	591	0	0	384	53	2,449	0	0	0	3	0	3,481	30%	70%	
Mixed Pasture	0	0	0	0	0	0	0	0	1,119	0	0	0	0	1,119	0%	100%	
Onions and Garlic	0	0	17	0	0	0	0	0	0	210	0	0	0	226	7%	93%	
Strawberries	0	0	0	0	0	35	0	0	0	0	2,130	0	0	2,166	2%	98%	
Unclassified Fallow	0	0	0	6	0	0	0	0	0	0	0	1,371	0	1,377	0%	100%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	559	559	0%	100%	
Predicted Total	349	252	7,086	424	2,401	6,975	958	2,598	1,119	228	2,151	1,426	559	26,526			
Commission Error	0%	0%	10%	2%	0%	12%	7%	6%	0%	8%	1%	4%	0%				
Users Accuracy	100%	100%	90%	98%	100%	88%	93%	94%	100%	92%	99%	96%	100%				
Kappa Coefficient																	0.93

Table 43. Colorado River Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference \ Predicted	Alfalfa and Alfalfa Mixtures	Carrots	Citrus	Cole Crops	Corn, Sorghum, and Sudan	Cotton	Dates	Flowers, Nursery, and Christmas Tree Farms	Grapes	Lettuce or Leafy Greens	Melons, Squash, and Cucumbers	Miscellaneous Grain and Hay	Miscellaneous Grasses	Miscellaneous Truck Crops	Mixed Pasture	Onions and Garlic	Peppers	Sugar Beets	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	20,937	0	0	0	5	0	0	0	0	0	0	0	130	0	0	0	0	0	0	21,072	1%	99%	
Carrots	0	1,473	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,473	0%	100%	
Citrus	0	0	1,315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,315	0%	100%	
Cole Crops	0	0	0	2,117	0	0	0	0	0	263	13	0	0	0	0	0	0	0	0	2,392	11%	89%	
Corn, Sorghum, and Sudan	0	0	0	0	3,785	0	0	0	0	0	0	27	74	62	0	0	0	0	0	3,948	4%	96%	
Cotton	0	0	0	0	0	843	0	0	0	0	0	0	0	0	0	0	0	0	0	843	0%	100%	
Dates	0	0	0	0	0	0	1,003	0	0	0	0	0	0	2	0	0	0	0	1	1,006	0%	100%	
Flowers, Nursery, and Christmas Tree Farms	0	0	0	0	0	0	0	61	0	0	0	0	0	0	0	0	0	0	0	61	0%	100%	
Grapes	0	0	0	0	0	0	0	0	777	0	0	0	0	0	0	0	0	0	0	777	0%	100%	
Lettuce or Leafy Greens	0	0	0	37	0	0	0	0	0	2,455	0	0	0	0	0	0	0	0	35	2,527	3%	97%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	0	0	0	0	724	0	0	0	0	0	0	0	0	724	0%	100%	
Miscellaneous Grain and Hay	150	0	0	0	85	0	0	0	0	0	0	4,600	145	0	0	0	0	0	0	4,980	8%	92%	
Miscellaneous Grasses	246	0	0	0	70	0	0	0	0	0	0	0	10,034	0	0	0	0	0	0	10,350	3%	97%	
Miscellaneous Truck Crops	0	0	0	133	0	0	0	8	0	51	0	0	0	1,083	0	0	0	0	3	1,278	15%	85%	
Mixed Pasture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	0	0	0	117	0%	100%	
Onions and Garlic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,207	0	0	0	2,207	0%	100%	
Peppers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	262	0	0	262	0%	100%	
Sugar Beets	0	0	0	218	0	0	0	0	0	0	0	0	0	0	0	0	0	2,971	0	3,189	7%	93%	
Unclassified Fallow	41	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	4,119	4,164	1%	99%	
Predicted Total	21,375	1,473	1,315	2,504	3,944	843	1,008	70	777	2,768	737	4,627	10,383	1,147	117	2,207	262	2,971	4,157	62,685			
Commission Error	2%	0%	0%	15%	4%	0%	0%	13%	0%	11%	2%	1%	3%	6%	0%	0%	0%	0%	1%				
Users Accuracy	98%	100%	100%	85%	96%	100%	100%	87%	100%	89%	98%	99%	97%	94%	100%	100%	100%	100%	99%				
Kappa Coefficient																							0.97

Table 44. North Coast Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Predicted: Alfalfa and Alfalfa Mixtures	Grapes	Miscellaneous Grain and Hay	Miscellaneous Grasses	Mixed Pasture	Potatoes	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	6,237	0	0	101	0	0	0	6,338	2%	98%	
Grapes	0	835	0	0	0	0	0	835	0%	100%	
Miscellaneous Grain and Hay	2	0	1,946	0	18	109	268	2,343	17%	83%	
Miscellaneous Grasses	537	0	0	266	0	0	0	803	67%	33%	
Mixed Pasture	73	0	0	0	2,405	0	0	2,479	3%	97%	
Potatoes	0	0	0	0	0	1,024	0	1,024	0%	100%	
Unclassified Fallow	0	0	0	0	0	0	2,497	2,497	0%	100%	
Predicted Total	6,850	835	1,946	367	2,423	1,133	2,764	16,318			
Commission Error	9%	0%	0%	28%	1%	10%	10%				
Users Accuracy	91%	100%	100%	72%	99%	90%	90%				
Kappa Coefficient											0.93

Table 45. North Lahontan Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Predicted: Alfalfa and Alfalfa Mixtures	Miscellaneous Grain and Hay	Miscellaneous Grasses	Mixed Pasture	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	4,149	47	23	0	0	4,220	2%	98%	
Miscellaneous Grain and Hay	0	1,176	48	38	34	1,296	9%	91%	
Miscellaneous Grasses	180	0	713	237	0	1,130	37%	63%	
Mixed Pasture	0	0	16	1,945	18	1,978	2%	98%	
Unclassified Fallow	0	13	0	55	750	818	8%	92%	
Predicted Total	4,329	1,236	800	2,275	802	9,441			
Commission Error	4%	5%	11%	15%	6%				
Users Accuracy	96%	95%	89%	85%	94%				
Kappa Coefficient									0.84

Table 46. Sacramento River Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Predicted: Alfalfa and Alfalfa Mixtures	Almonds	Corn, Sorghum, and Sudan	Grapes	Melons, Squash, and Cucumbers	Miscellaneous Deciduous	Miscellaneous Grain and Hay	Miscellaneous Grasses	Mixed Pasture	Olives	Peaches and Nectarines	Pears	Pistachios	Prunes	Rice	Safflower	Sunflowers	Tomatoes	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Alfalfa Mixtures	6,370	0	32	0	0	0	0	180	18	0	0	0	0	0	0	0	0	0	0	0	0	6,599	3%	97%	
Almonds	0	18,440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	195	18,641	1%	99%	
Corn, Sorghum, and Sudan	0	0	2,036	0	0	0	0	28	0	0	0	0	0	0	0	28	0	0	0	0	0	2,092	3%	97%	
Grapes	0	0	0	3,075	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3,076	0%	100%	
Melons, Squash, and Cucumbers	0	0	0	0	774	0	0	0	0	0	0	0	0	0	0	0	13	12	0	0	0	799	3%	97%	
Miscellaneous Deciduous	0	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	0%	100%	
Miscellaneous Grain and Hay	11	0	0	0	0	0	7,234	15	72	0	0	0	0	0	0	0	0	0	419	0	0	7,752	7%	93%	
Miscellaneous Grasses	552	0	70	0	0	0	70	1,276	84	0	0	0	0	0	0	0	0	0	76	0	0	2,128	40%	60%	
Mixed Pasture	0	0	0	0	0	0	2	1	6,905	0	0	0	0	0	0	0	0	0	0	0	0	6,908	0%	100%	
Olives	0	0	0	0	0	0	0	0	0	1,260	0	0	0	0	0	0	0	0	0	0	0	1,260	0%	100%	
Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	581	0	0	0	0	0	0	0	0	0	0	581	0%	100%	
Pears	0	0	0	0	0	0	0	0	0	0	0	857	0	0	0	0	0	0	0	0	0	857	0%	100%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	1,867	0	0	0	0	0	0	0	0	1,867	0%	100%	
Prunes	0	2	0	0	0	0	0	0	0	0	0	0	0	3,477	0	0	0	0	0	0	0	3,478	0%	100%	
Rice	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,094	0	0	0	0	0	0	8,094	0%	100%	
Safflower	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	592	0	0	100	0	0	692	14%	86%	
Sunflowers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,940	115	0	0	0	3,056	4%	96%	
Tomatoes	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	47	6,562	0	0	0	6,643	1%	99%	
Unclassified Fallow	0	82	0	0	0	0	30	0	80	0	0	0	52	0	0	0	0	0	23,755	2	0	24,001	1%	99%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	12,800	0	12,808	0%	100%	
Young Perennials	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0	88	0	415	519	20%	80%	
Predicted Total	6,932	18,523	2,139	3,075	807	55	7,336	1,500	7,159	1,260	581	865	1,919	3,493	8,094	620	3,001	6,689	24,438	12,809	610	111,907			
Commission Error	8%	0%	5%	0%	4%	0%	1%	15%	4%	0%	0%	1%	3%	0%	0%	5%	2%	2%	3%	0%	32%				
Users Accuracy	92%	100%	95%	100%	96%	100%	99%	85%	96%	100%	100%	99%	97%	100%	100%	95%	98%	98%	97%	100%	68%				
Kappa Coefficient																									0.97

Table 47. San Francisco Bay Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference		Predicted							
		Grapes	Miscellaneous grain and hay	Mixed Pasture	Unclassified Fallow	**Reference Total**	**Omission Error**	**Producers Accuracy**	**Kappa Coefficient**
	Grapes	1,274	0	0	0	1,274	0%	100%	
	Miscellaneous grain and hay	0	637	0	0	637	0%	100%	
	Mixed Pasture	0	0	34	0	34	0%	100%	
	Unclassified Fallow	0	22	0	107	130	18%	82%	
	Predicted Total	1,274	659	34	107	2,075			
	Commission Error	0%	3%	0%	0%				
	Users Accuracy	100%	97%	100%	100%				
	Kappa Coefficient								0.96

Table 48. San Joaquin River Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

		Predicted																					
		Alfalfa and Alfalfa Mixtures	Almonds	Cherries	Corn, Sorghum, and Sudan	Cotton	Grapes	Melons, Squash, and Cucumbers	Miscellaneous Grain and Hay	Miscellaneous Grasses	Miscellaneous Truck Crops	Mixed Pasture	Olives	Peaches and Nectarines	Pistachios	Sweet Potatoes	Tomatoes	Unclassified Fallow	Walnuts	Young Perennials	**Reference Total**	**Omission Error**	**Producers Accuracy**	**Kappa Coefficient**
Reference	Alfalfa and Alfalfa Mixtures	6,851	0	0	41	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	6,909	1%	99%	
	Almonds	0	32,897	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	0	32,935	0%	100%	
	Cherries	0	30	1,230	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	1,282	4%	96%	
	Corn, Sorghum, and Sudan	59	0	0	13,683	0	0	85	0	4	3	0	0	0	0	0	30	0	0	0	13,864	1%	99%	
	Cotton	0	0	0	0	3,127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,127	0%	100%	
	Grapes	0	0	0	0	0	5,181	0	0	0	0	0	0	0	0	0	0	0	0	0	5,181	0%	100%	
	Melons, Squash, and Cucumbers	0	0	0	0	0	0	838	0	0	0	0	0	0	0	0	0	74	0	0	912	8%	92%	
	Miscellaneous Grain and Hay	31	0	0	0	0	0	0	11,468	35	0	0	0	0	0	0	0	143	0	0	11,678	2%	98%	
	Miscellaneous Grasses	96	0	0	107	0	0	0	0	197	0	33	0	0	0	0	0	0	0	0	433	55%	45%	
	Miscellaneous Truck Crops	0	0	0	0	0	0	0	0	0	215	0	0	0	0	0	0	0	0	0	215	0%	100%	
	Mixed Pasture	5	0	0	0	0	0	0	0	0	0	2,485	0	0	0	0	0	0	0	0	2,490	0%	100%	
	Olives	0	0	0	0	0	0	0	0	0	0	0	308	0	0	0	0	0	0	0	308	0%	100%	
	Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	0	0	276	0	0	0	0	0	0	276	0%	100%	
	Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	0	3,509	0	0	117	0	0	3,626	3%	97%	
	Sweet Potatoes	0	0	0	0	0	0	8	0	0	0	0	0	0	0	1,110	0	0	0	0	1,117	1%	99%	
	Tomatoes	0	0	0	96	288	0	0	0	0	0	0	0	0	0	34	5,485	0	0	0	5,902	7%	93%	
	Unclassified Fallow	0	0	0	0	0	0	0	119	0	0	26	0	0	0	0	0	4,231	0	0	4,376	3%	97%	
	Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,128	0	6,128	0%	100%	
	Young Perennials	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	340	0	1,111	1,458	24%	76%	
	Predicted Total	7,042	32,934	1,230	13,926	3,415	5,181	931	11,588	236	218	2,562	308	297	3,548	1,144	5,515	4,904	6,128	1,111	102,218			
	Commission Error	3%	0%	0%	2%	8%	0%	10%	1%	17%	1%	3%	0%	7%	1%	3%	1%	14%	0%	0%				
	Users Accuracy	97%	100%	100%	98%	92%	100%	90%	99%	83%	99%	97%	100%	93%	99%	97%	99%	86%	100%	100%				
	Kappa Coefficient																							0.98

Table 49. South Coast Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Avocados	Bushberries	Citrus	Cole Crops	Flowers, Nursery, and Christmas Tree Farms	Miscellaneous Grain and Hay	Misc Subtropical Fruits	Miscellaneous Truck Crops	Strawberries	Unclassified Fallow	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Avocados	2,539	0	14	0	0	0	0	0	0	0	2,553	1%	99%	
Bushberries	0	394	0	0	5	0	0	0	16	0	414	5%	95%	
Citrus	53	0	2,046	0	0	0	0	0	0	0	2,098	2%	98%	
Cole Crops	0	14	0	191	0	0	0	0	0	0	204	6%	94%	
Flowers, Nursery, and Christmas Tree Farms	0	0	0	0	224	0	0	0	0	0	224	0%	100%	
Miscellaneous Grain and Hay	0	0	0	80	0	531	0	0	0	0	611	13%	87%	
Misc Subtropical Fruits	22	0	1	0	0	0	24	0	0	0	46	48%	52%	
Miscellaneous Truck Crops	0	0	0	422	13	0	0	1,577	4	0	2,017	22%	78%	
Strawberries	0	0	0	0	0	0	0	0	995	0	995	0%	100%	
Unclassified Fallow	0	2	0	0	0	0	0	0	0	1,109	1,110	0%	100%	
Predicted Total	2,613	410	2,061	692	241	531	24	1,577	1,015	1,109	10,272			
Commission Error	3%	4%	1%	72%	7%	0%	0%	0%	2%	0%				
Users Accuracy	97%	96%	99%	28%	93%	100%	100%	100%	98%	100%				
Kappa Coefficient														0.94

Table 50. South Lahontan Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Predicted: Alfalfa and Alfalfa Mixtures	Miscellaneous Grain and Hay	Mixed Pasture	Unclassified Fallow	Reference total	Omission error	Producers accuracy	Kappa coefficient
Alfalfa and Alfalfa Mixtures	2,413	0	0	0	2,413	0%	100%	
Miscellaneous Grain and Hay	0	691	0	0	691	0%	100%	
Mixed Pasture	0	0	2,927	61	2,988	2%	98%	
Unclassified Fallow	0	0	0	1,625	1,625	0%	100%	
Predicted Total	2,413	691	2,927	1,685	7,717			
Commission Error	0%	0%	0%	4%				
Users Accuracy	100%	100%	100%	96%				
Kappa Coefficient								0.97

Table 51. Tulare Lake Hydrologic Region Land Use Mapping Validation Data Error Matrix by Subclass Legend Level (acres)

Reference	Predicted: Alfalfa and Afalfa Mixtures	Almonds	Carrots	Cherries	Citrus	Corn, Sorghum, and Sudan	Cotton	Grapes	Melons, Squash, and Cucumbers	Miscellaneous Grain and Hay	Miscellaneous Truck Crops	Mixed Pasture	Onions and Garlic	Peaches and Nectarines	Pistachios	Plums	Pomegranates	Potatoes	Tomatoes	Unclassified Fallow	Walnuts	Young Perennials	Reference Total	Omission Error	Producers Accuracy	Kappa Coefficient
Alfalfa and Afalfa Mixtures	7,262	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,262	0%	100%	
Almonds	0	33,479	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33,479	0%	100%	
Carrots	0	0	716	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	716	0%	100%	
Cherries	0	0	0	405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	405	0%	100%	
Citrus	0	0	0	1	2,618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2,628	0%	100%	
Corn, Sorghum, and Sudan	0	0	0	0	0	18,948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,948	0%	100%	
Cotton	0	0	0	0	0	0	4,424	0	0	0	0	0	0	0	0	0	0	0	0	75	0	0	4,498	2%	98%	
Grapes	0	0	0	0	0	0	0	8,974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,974	0%	100%	
Melons, Squash, and Cucumbers	0	0	0	0	0	0	0	0	376	0	0	0	0	0	0	0	0	0	0	0	0	0	376	0%	100%	
Miscellaneous Grain and Hay	0	0	0	0	0	0	0	0	0	16,599	0	0	0	0	0	0	0	0	0	675	0	0	17,275	4%	96%	
Miscellaneous Truck Crops	0	0	0	0	0	0	0	0	0	0	323	0	77	0	0	0	0	0	0	0	0	0	400	19%	81%	
Mixed Pasture	0	0	0	0	0	0	0	0	0	0	0	239	0	0	4	0	0	0	0	0	0	0	243	2%	98%	
Onions and Garlic	0	0	0	0	0	0	0	0	0	0	0	0	1,908	0	0	0	0	0	0	4	0	0	1,912	0%	100%	
Peaches and Nectarines	0	0	0	0	0	0	0	0	0	0	0	0	0	752	0	0	0	0	0	0	0	0	752	0%	100%	
Pistachios	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,103	0	0	0	0	0	0	0	19,103	0%	100%	
Plums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	228	0	0	0	0	0	0	228	0%	100%	
Pomegranates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	641	0	0	0	0	0	642	0%	100%	
Potatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	997	0	0	0	0	997	0%	100%	
Tomatoes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,732	0	0	0	4,732	0%	100%	
Unclassified Fallow	0	0	0	0	0	0	0	0	0	194	0	39	0	82	0	0	0	0	0	25,672	0	0	25,987	1%	99%	
Walnuts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,857	0	2,857	0%	100%	
Young Perennials	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	257	0	1,583	1,840	14%	86%	
Predicted Total	7,262	33,479	716	405	2,618	18,948	4,424	8,974	376	16,793	323	278	1,985	835	19,108	228	641	997	4,732	26,683	2,857	1,593	154,252			
Commission Error	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	14%	4%	10%	0%	0%	0%	0%	0%	4%	0%	1%				
Users Accuracy	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	100%	86%	96%	90%	100%	100%	100%	100%	100%	96%	100%	99%				
Kappa Coefficient																										0.99