PRAIRIE CREEK LABS

How the Fair Ranch model works

A plain-language guide to what the model does, what goes into it, and what it predicts

Prairie Creek Labs for the Delta Flows Coalition · October 2026 · model results as of 2026-10-17

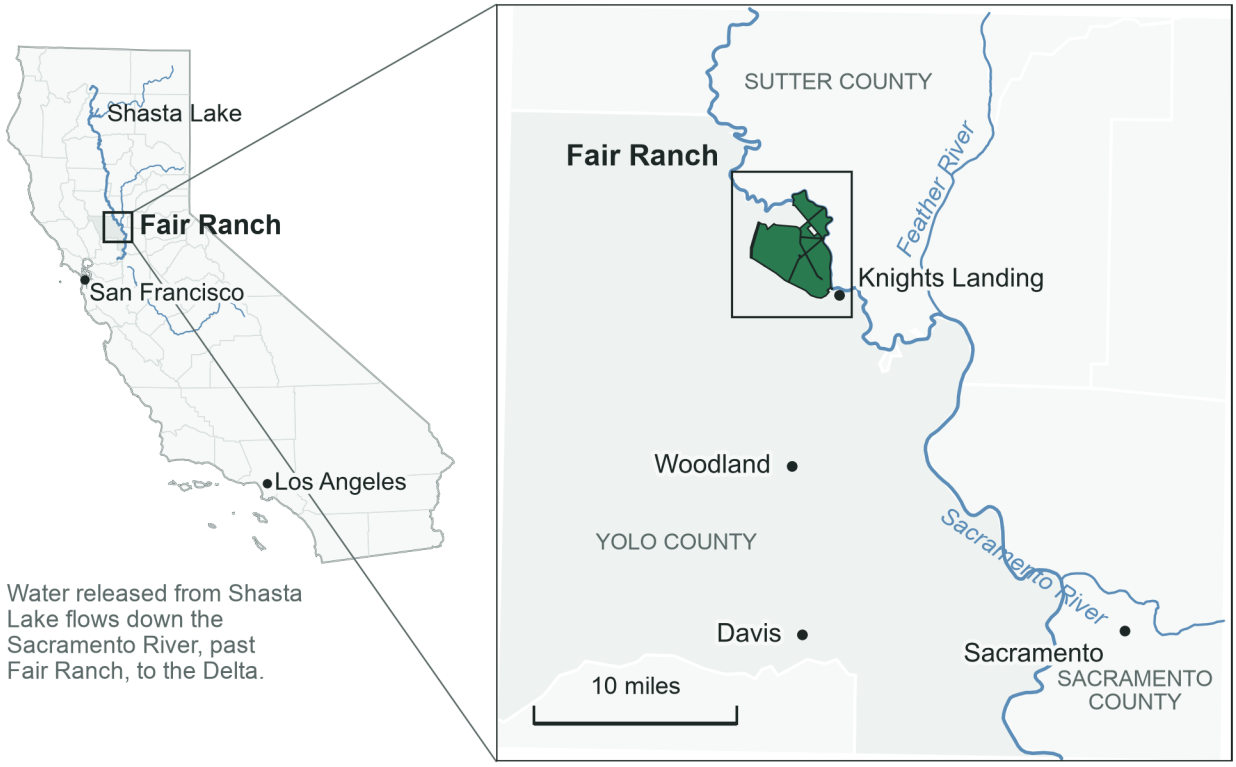
In brief

- The State of California paid $179.95 million for Fair Ranch, a 7,521-acre farm in Yolo County, to leave some of its Sacramento River water in the river from January to June each year. The contract requires delivery of at least 5,000 acre-feet a year and asks the owner to seek up to 16,000.
- We built a model to examine what actual deliveries might be. The model counts that water the way the contract says it must be counted. Its central case idles every eligible acre, farms no field with groundwater in place of river water, and assumes no groundwater pumping in non-transfer years for the baseline calculation. As modeled, the Fair Ranch property alone delivers 10,566 acre-feet in the average year. This average is a weighted blend of year types, ranging from 11,690 acre-feet in a Wet year to 5,968 in a Drought Protection Program year.
- Two commitments the owner has already made come out of that water. Under the Drought Protection Program the owner gives up more river water in the driest years. Under the Healthy Rivers and Landscapes (HRL) program, as articulated by the Yolo MOU, about 1,400 acre-feet go to HRL in Above Normal, Below Normal and Dry years. That costs the contract's credit 944 acre-feet in each of those years, or 501 a year averaged over all years (section 8).
- Replayed over the 25 water years 2000–2024, the ranch never reaches 16,000. It falls below the 5,000 floor once, in 2022 (2,104 AF), when river supplies fell to 18% of normal.
- Annualized at 7% real, the price is $1,192 per acre-foot a year.
- RD 108's own farmland next door, Tract 6, could in principle fill the gap to 16,000 in most years, but the contract sets no volume for it and has no way to count it. It is outside our totals (Appendix C).

1. The deal

The contract is DWR Grant Agreement 4600016769, signed in June 2026 by DWR, RRG Garden Properties LLC and Reclamation District 108 (RD 108). When it was signed, RRG owned the ranch and had agreed to sell it, with its water rights, to RD 108 under a purchase and sale

agreement of May 13, 2026 (Grant Agreement § 6.H). Once that sale closes, RD 108 takes on all of the owner's rights and duties under the contract, and RRG and RD 108 are jointly and severally liable to DWR (Forbearance Agreement § 12.a). We have not confirmed whether the sale has closed. The State pays the two grantees. In return, the owner gives up part of the river water it would normally take to irrigate. That water stays in the Sacramento River between January and June, as extra flow for fish and the Delta. The commitment is permanent.



Boundaries and places: US Census Bureau 2023 cartographic boundaries. Rivers: USGS National Hydrography Dataset (region), Natural Earth (state). Ranch outline: Yolo County tax parcels (35 APNs in the contract).

Figure 1. Where Fair Ranch is. The ranch lies on the Sacramento River in Yolo County, just upstream of Knights Landing and about 25 miles northwest of Sacramento. Water released from Shasta Lake flows past it to the Delta. Figure 2 shows the ranch's crops.

The contract sets two numbers:

- **The Minimum Volume (the floor):** at least 5,000 acre-feet every year (Forbearance Agreement § 2.f).
- **The Expected Volume (the target):** "up to 16,000 acre-feet" that "could under historic conditions be made available" (§ 2.b). The owner owes "economically feasible efforts" toward it (§ 6.b.iii).

What the contract enforces (or fails to enforce)

Only the 5,000 AF floor has a remedy with force:

- **The 16,000 AFY target is unreachable from Fair Ranch.** The Fair Ranch property alone delivers at most 11,690 AF, in a Wet year (section 5).
- **Above 5,000 AF, enforcement is limited.** Between 5,000 and 16,000 AF the owner owes "economically feasible efforts" (§ 6.b.iii), and a shortfall leads to a "meet and confer" on corrective actions "that are economically feasible and within Owner's reasonable control" (§ 13.b).
- **Below 5,000 AF, DWR may, but need not, take the property.** Only two misses in any ten years count, and then DWR has "the contractual right, but not the obligation" to take the property (§ 13.c). These are DWR's "sole and exclusive remedies" (§ 13.d).
- **Tract 6 make-up is not enforceable.** RD 108 need only "jointly and in good faith coordinate" its adjoining Tract 6 with the ranch (§ 6.b.iv), and Exhibit D-2, the contract's water accounting, has no method for counting Tract 6 water (Appendix C).

Grant Agreement 4600016769, Exhibit D (Instream Flow and Forbearance Agreement): Expected and Minimum Volumes, § 2; economically feasible efforts, § 6.b.iii; Tract 6, § 6.b.iv; shortfall meet and confer, § 13.b; Remedy Trigger Event, § 13.c; sole and exclusive remedies, § 13.d.

2. The main idea behind the model

When a farmer leaves a field unplanted, how much water does that put back in the river? The contract's answer is: only the water the crop would have used up.

Farms put more water on a field than the crop consumes. The rest soaks into the ground or drains back to the river, where someone downstream uses it again. Only the part the crop would have consumed is new water. Agencies call this ETAW (evapotranspiration of applied water).

The contract does not measure ETAW field by field. It uses a fixed table of acre-feet per acre for each crop, from a December 2019 DWR and Reclamation guidance document known as the "White Paper" (source in Section 11, below). The contract freezes that table permanently, "notwithstanding any future changes in technical or scientific understanding" (§ 6.b.v.2). So the model is straightforward arithmetic:

water credited = acres left unplanted × acre-feet per acre for the crop that would have been grown

The inputs to the model answer three questions: which crops would have been grown, how much river water there was that year, and what groundwater can add.

3. Step 1: what would have been grown

To know what an unplanted acre is worth, you need to know what would have been grown on it. The model gets this from the State's crop maps. DWR, working with the firm Land IQ, maps every farm field in California from satellite imagery each year. The model cuts those maps to the ranch's boundary, which is drawn from the 35 county parcels the contract lists.

The contract says the baseline comes from years since 2015 in which no water was transferred (Exhibit D-2 § A.I.a). Four mapped years qualify: 2016, 2019, 2023 and 2024. The other years had transfers (2018, 2020, 2021), had a severe supply cut (2022), or have no State map (2015, 2017). The model averages the crop mix of those four years.

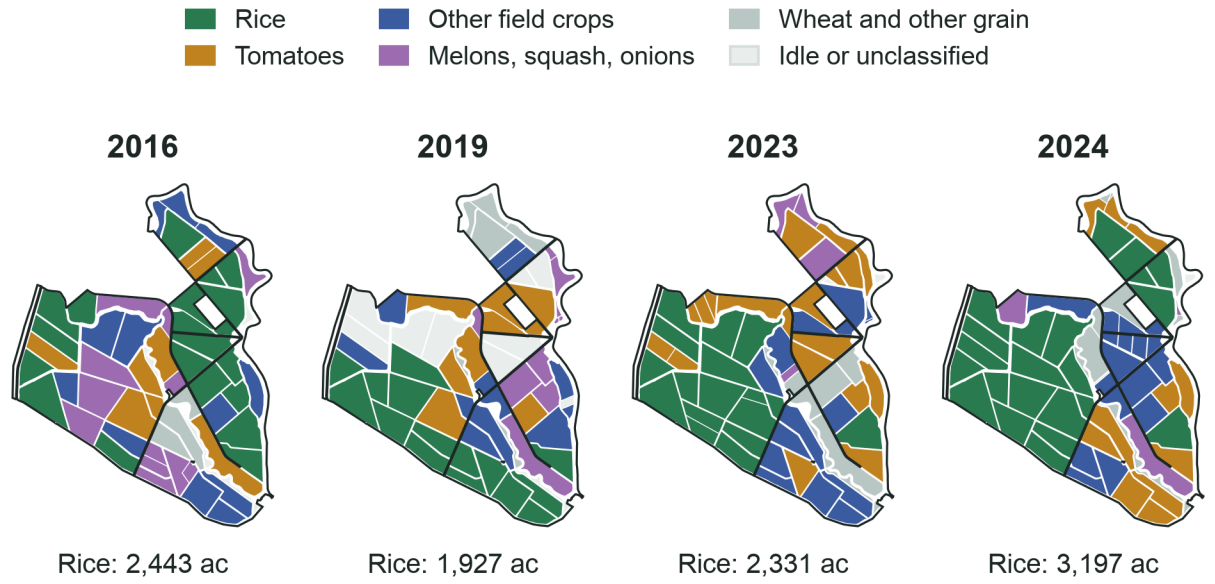


Figure 2. Crops on Fair Ranch in the four baseline years. The mix shifts a lot from year to year: rice ranged from 1,927 to 3,197 acres. That is why the model uses an average. DWR marks its 2024 map provisional.

On average the ranch grows about 6,284 acres of mapped crops, 5,970 of them irrigated. Rice is the largest single crop, at about 2,474 acres.

4. Step 2: what each unplanted acre is worth

Each crop has its own value in the White Paper's table. Rice is by far the thirstiest crop on the ranch, so it does most of the work.

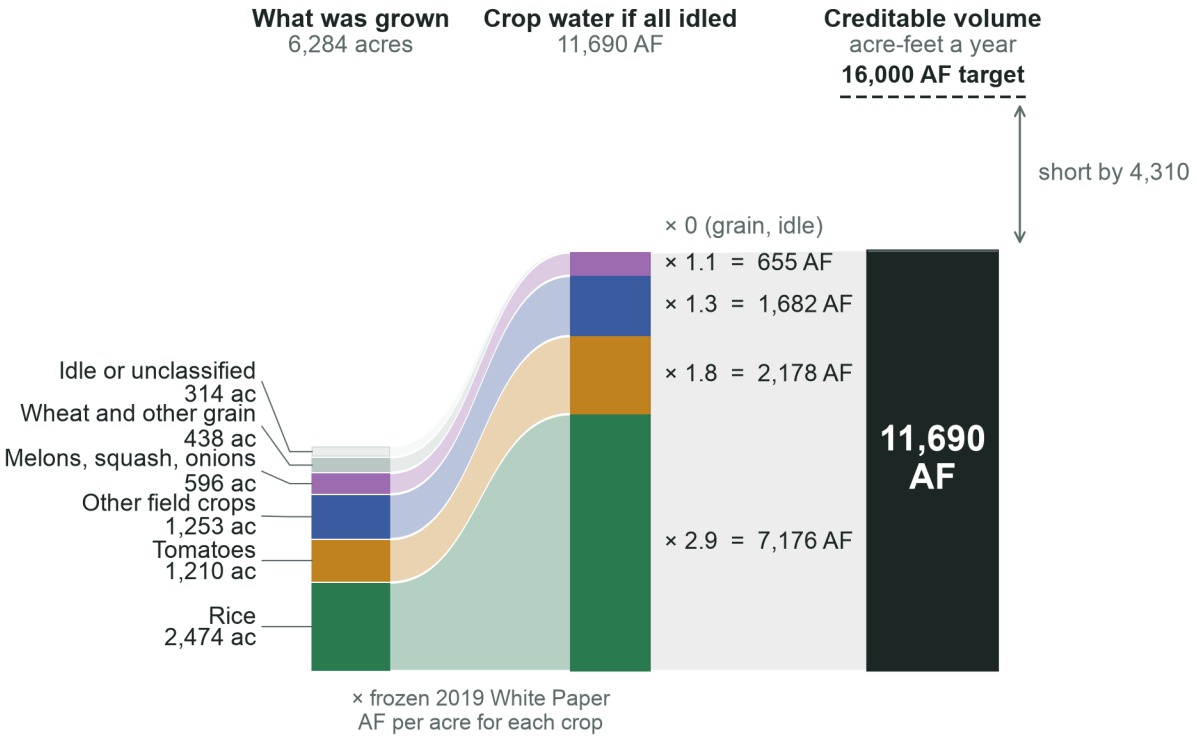
Crop group	Average acres	AF per acre	AF if all left unplanted
Rice	2,474	2.9	7,176
Tomatoes	1,210	1.8	2,178
Sunflower, corn, safflower, alfalfa, beans	1,253	1.3	1,682
Melons, squash, onions	596	1.1	655
Wheat and other grain	438	0.0	0
Idle or unclassified	314	0.0	0
Total	**6,284**		**11,690**

AF per acre from the December 2019 White Paper, Table 2-1. "Other field crops" is an average of sunflower 1.4, corn 1.8, alfalfa 1.7, beans 1.5 and safflower 0.7.

- **Rice at 2.9 is set by the contract.** The contract names the December 2019 version of the White Paper, which lists 2.9. An earlier September 2019 draft said 3.3.
- **Grain counts zero.** Wheat and other grain grow over winter on rain, so leaving them unplanted saves no summer river water. They are not on the White Paper's list.
- **Idle land counts zero.** Land that was already idle has nothing to give up.

5. Step 3: add it up

If every acre were left unplanted, the crops' water would add up to 11,690 acre-feet, and the model credits all of it, with the exception of the HRL holdback (see Section 8, below). Figure 3 shows how acres turn into acre-feet, crop by crop.



Baseline: average crop mix of 2016, 2019, 2023, 2024 (DWR/Land IQ crop maps).
Crop rates: Dec 2019 DWR/Reclamation Water Transfer White Paper, Table 2-1, frozen by contract Exhibit D-2.
One vertical scale (1 acre = 1 AF), so each band widens or narrows by its crop's AF per acre. Other field crops: average rate.

Figure 3. Acres become acre-feet at each crop's frozen rate. Acres and acre-feet are drawn to the same scale, so rice's band nearly triples in width while grain's disappears.

In this scenario, the owner idles 5,497 of the 5,970 irrigated acres: every eligible acre. The other 473 are grain and other fields with no White Paper crop value, so idling them earns nothing. Nothing comes off for groundwater. The White Paper excludes “fields historically irrigated by groundwater” (§ 2.2.5), but data we have obtained indicate there is no groundwater pumping in non-transfer years on the ranch, so its crops take all their water from the river and the exclusion removes nothing (section 7).

Reaching 16,000 would take another 4,310 acre-feet: the equivalent of about 1,490 more acres of rice, on land the ranch does not have. In 2021, a transfer of nearly 16,000 AF was made under a contract which counted groundwater much more generously than this contract does (section 7).

6. Step 4: drought shrinks the river supply, not the crops

The ranch's river water comes from River Garden Farms' Settlement Contract with the U.S. Bureau of Reclamation (contract 878A-R-1), for 29,800 acre-feet a year. That contract also serves the owner's other land, so the model gives Fair Ranch the share its own crops need: 18,459 acre-feet in a full year (62% of the contract).

In years of short supply the contract is cut. Two contract rules then apply (Exhibit D-3 Art. 4 and White Paper § 2.5):

- **A cap:** water left in the river plus water still taken cannot exceed that year's supply;
- **A smaller baseline:** if the reduced supply could not have watered the ranch's normal crops, the baseline shrinks in proportion. You cannot get credit for not watering crops you could not have watered.

Kind of year	When it happens	River supply to the ranch (AF)	Baseline reduction (AF)	Credited (AF)
Full supply	most years	18,459	0	11,690
Shasta Critical	Shasta inflow forecast at or below 3.2 million AF; contract cut 25%	13,844	2,922	8,767
Drought Protection Program year	from 2025, the driest years; a further 7,136 AF cut	9,424	5,722	5,968
2022-type	supply fell to 18% of contract totals	3,323	9,586	2,104

Every eligible acre left unplanted; before the HRL holdback (section 8). Whether the baseline reduction applies is debatable: in 2021, a Shasta Critical year, Reclamation credited that year's transfer without one. Without it, a Shasta Critical year gives 11,690 and a 2022-type year 3,323 (section 9).

RD 108's records of its own deliveries to the ranch, which the model does not use, are in Appendix D.

7. Step 5: why groundwater adds nothing

Groundwater enters the contract's accounting in two ways: as pumping the ranch already does, which shrinks what idling can earn, and as new pumping that replaces river water on fields still farmed (“groundwater substitution”), which can earn credit. In the central case neither moves the result.

Existing pumping: none. The White Paper will not count idling on “fields historically irrigated by groundwater” (§ 2.2.5): idling them saves groundwater, not river water. There is no groundwater pumping in non-transfer years on Fair Ranch, so every baseline crop is watered from the river and the rule removes nothing. Exhibit D-2 measures existing pumping from the owner's own records of non-transfer years (§§ A.II.a and B.II.c).

New pumping: barred, then capped. In 2021 groundwater substitution produced nearly half of River Garden Farms' 15,597 acre-foot transfer. The Fair Ranch contract makes it worth much less:

- **Only 50% counts.** Only half of the extra pumping counts, because pumping draws down the river too. The 2021 transfer subtracted only 13% (Exhibit D-2 § B.II.a).
- **A cap.** All pumping on the ranch is capped at 0.64 acre-feet per acre, or 4,813 acre-feet (§ C.1). So substitution could credit at most about 2,400 acre-feet a year.
- **A three-year pause.** Substitution is not allowed in 2026–2028 (Forbearance Agreement § 6.a).
- **It needs farmed fields.** Pumping only counts where it replaces river water on a field still being farmed. With every eligible field unplanted, there is nothing left to replace.

New or existing wells: it makes no difference. The contract counts pumping, not wells. Credit goes to pumping above the baseline set from the ranch's non-transfer years (Exhibit D-2 § A.II), from any well on the property: § B.II.b inventories all of them. With no groundwater pumping in non-transfer years, that baseline is zero, so every acre-foot pumped to replace river water would count, at 50%, whether the well is new or already there.

The central case idles every eligible acre, so no field is left to farm with groundwater, and groundwater adds nothing, during the 2026–28 pause or after it.

Sensitivity: fields farmed with groundwater. Substitution beats idling only on fields whose crops consume little of the water put on them: on the ranch, the grain, safflower and alfalfa. If those fields were farmed with groundwater after 2028 instead of idled, they would add about 306 acre-feet a year (11,996 in a Wet year), and the average would be 10,872 acre-feet at $1,159 per acre-foot a year. We show this only as a sensitivity (section 9): it needs new pumping on a ranch with no groundwater pumping in non-transfer years, and it is barred in 2026–28.

The grantee's proposal names RD 108's Tract 6 as the fallback for the groundwater substitution the contract now restricts (Appendix C).

8. Putting it together: 25 previous years

To see how the ranch would perform over time, the model replays the past. For each water year from 2000 to 2024 it asks: if this contract and its rules, and other current programs such as the Drought Protection Program had been in force, how much would the ranch have been credited? The crops are the same every year, because the contract fixes the baseline. What changes is the river supply.

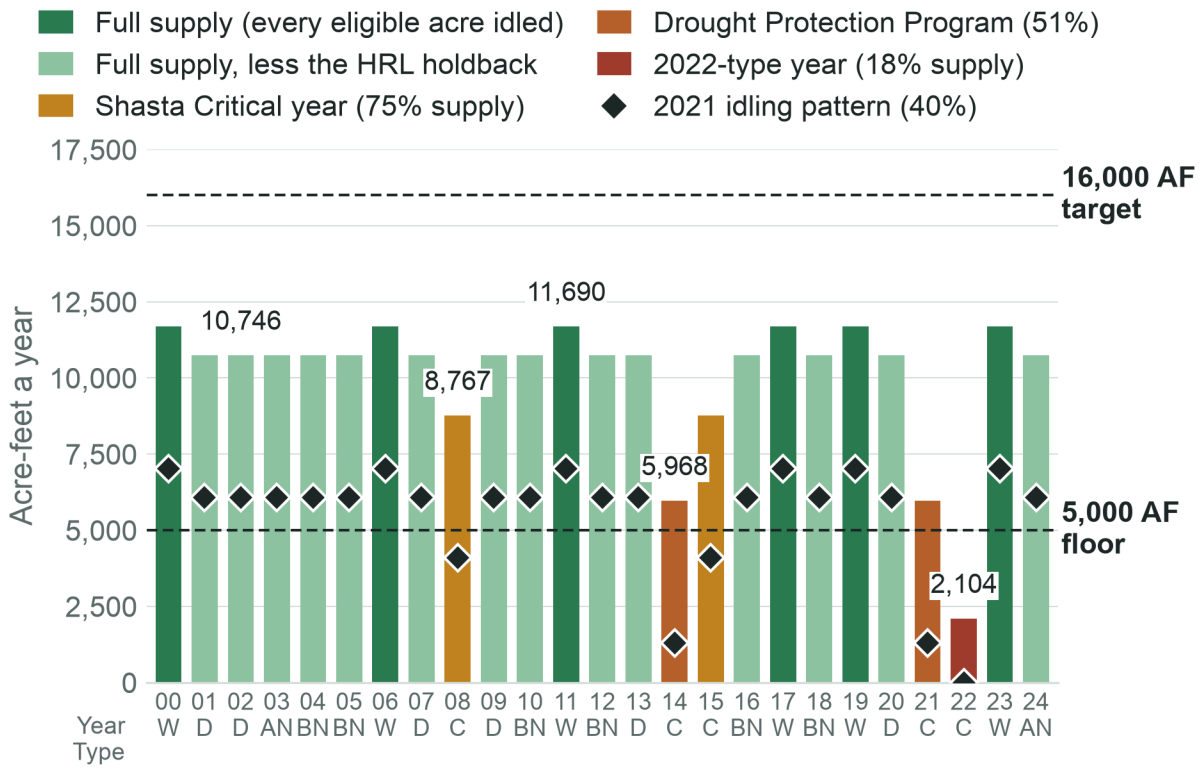


Figure 4. Credited volume in each water year 2000–2024, as if the contract had been in force. 11,690 AF in Wet years, 10,746 in Above Normal, Below Normal and Dry years (after the HRL holdback), 8,767 in Shasta Critical years, 5,968 in the Drought Protection Program years 2014 and 2021, 2,104 in 2022. The target is reached in no year. Diamonds: the 2021 idling pattern, when River Garden Farms left 2,415 of the ranch's 5,970 irrigated acres (40%) unplanted. Source: Prairie Creek Labs Fair Ranch compliance model.

- **Most years look alike.** Wet years credit 11,690 acre-feet. Above Normal, Below Normal and Dry years credit 10,746, because the HRL holdback comes out of them.
- **Shasta Critical years fall by about a quarter.** Shasta Critical years (2008, 2015) drop to 8,767.
- **Drought Protection Program years fall by half.** 2014 and 2021 met all four Drought Protection Program conditions, so they drop further, to 5,968: still above the floor.
- **A 2022-type year breaks the floor.** 2022 drops to 2,104, below the floor.
- **The target is never reached.** 16,000 is reached in 0 of 25 years.
- **Lower effort is much riskier.** The owner only idled 40% of the ranch in its 2021 transfer. At that effort, Wet years give 7,012 and Above Normal, Below Normal and Dry years 6,068. Every Shasta Critical year gives 4,090, below the floor, Drought Protection Program years 1,290, and a 2022-type year nothing. That is 5 misses in 2000–2024 (2008, 2014, 2015, 2021, 2022), and 2014–2015 alone would be two misses within ten years: a Remedy Trigger Event (§ 13.c).

In 2000–2024 the Shasta Critical years were the same years DWR classed as Critical (2008, 2014, 2015, 2021 and 2022), so our memo and slides simply call them Critical years. To average the results, the model weights each kind of year by how often it occurs over the long record (HRL Global Agreement App. 1 Table 1b, the weights the memo uses throughout):

Kind of year	Share of years	Credited (AF)
Wet	32%	11,690
Above Normal, Below Normal, Dry (less the HRL holdback)	53%	10,746
Critical: Shasta Critical	8.4%	8,767
Critical: Drought Protection Program year	6.6%	5,968
Weighted average	**100%**	**10,566**

To compare a one-time payment with yearly purchases, we convert it to the equal payment made every year, forever. At 7% real, the $179.95 million price is $12.6 million a year. Spread over 10,566 acre-feet, that is $1,192 per acre-foot a year. Had the ranch delivered 16,000 acre-feet, it would be $787. The average leaves out 2022-type years: if one year in 25 were like 2022, it would be 10,299 acre-feet and $1,223.

A note on the financial calculations: We annualize at 7% real, the federal rate for public investment (OMB Circular A-94) and the rate the VA budget itself implies: $490m for 81,680 AF a year of permanent water is $5,999 per AF of yearly yield, against water worth about $420 a year at market prices. It is also consistent with a 3% real risk-free rate plus 400 basis points for drought-correlated deliveries, weak enforcement and illiquidity.

Reclamation's Shasta Critical declarations for 2008, 2014 and 2015 are not yet confirmed from primary sources. 2020 was declared Shasta Critical and then rescinded, so it is treated as a full-supply year.

What the Drought Protection Program and the HRL holdback take out

The model's central case includes two commitments the owner made before the Fair Ranch contract. Neither is in the contract's own accounting, but both use the same river water.

- **The Drought Protection Program.** Reclamation's 2025 program for the Settlement Contractors. In a Program Year the owner's contract is cut by a further 7,136 acre-feet (EA Table 2-1, p.8), leaving 51% of the contract. Phase 1 runs to February 2035. A Program Year needs all four of the EA's conditions: end-of-April Shasta storage under 3.0 million acre-feet, end-of-September under 2.0, October–April inflow under 2.5, and a Critical Year (§ 2.2.2, p.20). Reclamation's modeling expects 0.66 Program Years a decade, so the average counts 6.6% of years at 5,968. In the replay, 2014 and 2021 met all four. 2022 did too, but it is already a 2022-type year.
- **The HRL holdback.** The Yolo MOU (§ 5.a) lets the ranch be fallowed “to make water available for the Sacramento River Settlement Contractors conveyance to the proposed [HRL Program] (about 1,400 acre-feet from the Fair Ranch in certain years).” The model

reads “certain years” as the Above Normal, Below Normal and Dry years in which the Settlement Contractors owe their 100,000 acre-feet (Bay-Delta Plan p.71). Those are 53% of years.

The HRL counts an idled acre of rice as 4.3 acre-feet: 3.3 in the irrigation season plus 1.0 of fall water (2024 HRL Implementing Agreement, Exhibit B, § 3.1.A fn. 2, PDF p.219; Bay-Delta Plan App. B.1 § B.1.7.2). So 1,400 HRL acre-feet is 326 acres of rice. The Fair Ranch contract would have credited those same acres at its own 2.9, so the contract's credit loses 326 × 2.9 = 944 acre-feet, not 1,400.

The model works this out each year from the acres it idles. The HRL acres come out of the rice actually idled that year. If the owner idles fewer than 326 acres of rice, the holdback is smaller. The baseline reduction in short-supply years (White Paper § 2.5) stays with the contract's credit: it depends on the year's supply, and calling some idled acres HRL acres does not change it. At full effort the holdback is therefore the whole 944 acre-feet.

How much each commitment moves the average and the price:

	Average (AF a year)	**Price ($ per AF a year)**
Neither	11,252	$1,119
Drought Protection Program only	11,067	$1,138
HRL holdback only	10,751	$1,172
Both (central case)	**10,566**	**$1,192**

The HRL holdback costs more than the Drought Protection Program because it comes every Above Normal, Below Normal and Dry year. On the other hand, Program Years are rare. The holdback also lasts as long as the HRL program does, while Phase 1 of the Drought Protection Program ends in 2035. If every Critical year were a Program Year, the average would be 10,331 acre-feet ($1,219). Neither commitment moves the floor test at full effort: a Program Year gives 5,968 and an HRL year 10,746, both above 5,000.

9. What we assumed, and what would change the answer

Most of the model is fixed by the contract. These inputs are not, and each one moves the result:

Assumption	**What the model uses**	**If it is different**
How hard the owner tries	Every eligible acre left unplanted, the most the ranch can do by idling	The owner only idled 40% of the ranch in its 2021 transfer. At that effort: 7,012 in a Wet year, 4,090 in a Shasta Critical year (below the floor), average 5,888

Assumption	What the model uses	If it is different
Ranch's share of River Garden Farms' 29,800 AF Settlement Contract with Reclamation (878A-R-1)	0.62, what its own crops need	If the whole contract went to the ranch: 9,635 in a Drought Protection Program year; a 2022-type year still misses (3,397)
Existing groundwater pumping	None: no groundwater pumping in non-transfer years	Nothing to change: the ranch had no pumping to deduct, so White Paper § 2.2.5 (fields watered by groundwater are excluded) removes nothing
Fields farmed with groundwater (groundwater substitution)	None: every eligible acre idled	If the grain, safflower and alfalfa were farmed with groundwater pumping after 2028: about 306 AF more (11,996 in a Wet year); average 10,872, $1,159 per AF a year. Nothing in 2026–28
Rice credit	2.9 AF per acre (the contract's table)	The White Paper allows 2.1 if water cannot be stored in May–June. Then: 9,711 in a Wet year, and a Drought Protection Program year misses (4,958)
Baseline reduction in short-supply years	Applied (White Paper § 2.5)	Without it: 11,690 in a Shasta Critical year, 3,323 in a 2022-type year
Corn, sorghum and sudan grass (mapped as one group)	Corn's 1.8 AF per acre	At sudan grass's 3.0: at most 12,056 in a Wet year
Drought Protection Program	Phase 1 Program Years at Reclamation's modeled rate, 0.66 a decade	Left out: average 10,751. Every Critical year a Program Year: 10,331
HRL holdback	1,400 HRL AF = 326 acres of rice = 944 AF of the contract's credit in Above Normal, Below Normal and Dry years	Left out: average 11,067
RD 108's Tract 6	Left out. The contract asks RD 108 to coordinate its own Tract 6 farmland with the ranch, but sets no volume and no way to count it	Tract 6 water would add to the credit only if RD 108 chose to idle its own land and DWR accepted it. Appendix C works out how many acres each shortfall would take

None of the changes to the ranch's own inputs brings it to 16,000. Most of them make the floor easier or harder to meet in the driest years.

10. Glossary

Term	Meaning
Acre-foot (AF)	Water covering one acre one foot deep: 325,851 gallons.
ETAW	Evapotranspiration of applied water: the part of irrigation water a crop consumes. Only this part becomes new river water when a field is left unplanted.
Forbearance	Agreeing not to use a water right one holds, so the water stays in the river.
Groundwater substitution	Pumping groundwater onto a crop in place of river water, so the river water stays in the river. The contract counts half of it, caps it, and bars it in 2026–28.
Settlement Contract	A contract between Reclamation and a Sacramento River water user whose rights predate the federal Central Valley Project. Fair Ranch's water comes from contract 878A-R-1, for 29,800 AF a year.
Shasta Critical year	A year when Reclamation forecasts inflow to Shasta Lake at or below 3.2 million AF. Settlement Contract supplies are then cut 25%. In 2000–2024 these were the years DWR classed as Critical.
Drought Protection Program	A 2025 agreement under which Settlement Contractors give up more water in the driest years (7,136 AF more for this owner, 2025–2035).
HRL (Healthy Rivers and Landscapes)	The State's program for the Bay-Delta Voluntary Agreements. The Settlement Contractors owe it 100,000 AF in Above Normal, Below Normal and Dry years, counted at 4.3 AF per idled acre of rice. About 1,400 AF of it comes from Fair Ranch (MOU § 5.a).
Reclamation District 108 (RD 108)	A Sacramento Valley water district and a party to the contract. It delivers some of the ranch's water, is buying the ranch, and owns the Tract 6 farmland.
Tract 6	RD 108's own leased farmland, west of and adjoining the ranch, watered under RD 108's own Settlement Contract (Appendix C).
Exhibit G	The grantee's proposal, attached to Grant Agreement 4600016769.
Water year type	DWR's classification of each year's Sacramento Valley runoff: Wet, Above Normal, Below Normal, Dry or Critical.
White Paper	DWR and Reclamation's December 2019 guidance on counting water transfers. The contract freezes its crop values.
Baseline	What would have been grown on the ranch had no water been given up.

11. Data sources and how to check them

Every input below is public or comes from the contract.

Input	Used for	Source (link)	How to check
Location map: boundaries, towns, rivers	Where the ranch is (Fig. 1); not used in any calculation	US Census Bureau 2023 cartographic boundary files	Rivers near the ranch: USGS National Hydrography Dataset; statewide rivers and Shasta Lake: Natural Earth.
Ranch boundary	Which land counts as the ranch	Yolo County tax parcels (SACOG open data)	The 35 APNs are in the contract's Exhibits D-4 to D-6 (recording headers). Mapped area 7,457 ac against 7,521 ac in the contract (p.3).
Crops by field, 2016 and 2018–2024	What would have been grown (Fig. 2, 3)	DWR / Land IQ Statewide Crop Mapping	Open any year's map, filter to the ranch, and compare acres by crop with Figure 2 and Appendix B. 2024 is provisional.
Crop water rates (ETAW)	AF per unplanted acre (Fig. 3)	DWR & Reclamation, Draft Technical Information for Preparing Water Transfer Proposals, Dec 2019 (archived copy)	Table 2-1 (PDF p.20). Frozen by contract Exhibit D-2 § A.I.b (p.72) and § D (p.80).
Applied water per crop	How much river water the crops need (short-supply rules only)	State Water Board 2026 Staff Report, App. A3 (SWAP)	Table A3-8, Region 6 (PDF p.14).
Water year types, 2000–2025	Year labels (Fig. 4, RD 108 table)	DWR CDEC, WSIHIST water-year index	Use the table “Official Year Classifications based on May 1 Runoff Forecasts,” Sacramento Valley column.
Shasta Critical years	Which years get the 25% cut (Fig. 4)	Reclamation news releases, e.g. 2020 declaration	2020 rescinded: RecordID 71205. 2021 and 2022 confirmed in the Drought Protection Program EA. 2008, 2014 and 2015 not yet confirmed.
Contract supply: 29,800 AF and the 25% cut	River water available each year	Settlement Contract 878A-R-1 (State Water Board exhibit SVG-15-036)	Exhibit A: base 29,300 + project 500 = 29,800 AF. The 25% cut is Art. 5(a) of the standard form (RD 108 contract, p.14).

Input	Used for	Source (link)	How to check
2022 supply (18%) and Drought Protection Program cut (7,136 AF)	Short-supply tiers	Reclamation, SRSC Drought Protection Program EA (Nov 2024 draft)	§ 2.1 (18% in 2022); Table 2-1 (RRG Garden Properties, 7,136 AF); § 2.2.2 p.20 (four conditions, 0.66 Program Years a decade).
HRL holdback	1,400 HRL AF in Above Normal, Below Normal and Dry years (section 8)	RD 108 / Yolo County / YSGA MOU (May 18, 2026), § 5.a; 2024 HRL Implementing Agreement, Exhibit B	MOU § 5.a (YSGA packet p.70); Implementing Agreement § 3.1.A fn. 2 (PDF p.219): 4.3 AF per idled acre of rice; Bay-Delta Plan p.71 (which years).
Share of years of each type	The 10,566 AF average (section 8)	HRL Global Agreement, App. 1 Table 1b	Critical 15%, Dry 22%, Below Normal 17%, Above Normal 14%, Wet 32%. The memo uses the same weights.
7% rate and VA budget	The 7% real rate and the price (section 8)	OMB Circular A-94; VA MOU App. 3 Table 4 (permanent purchases budget); Final Draft Bay-Delta Plan p.75	$490m for 81,680 AF a year of permanent water, against the median north-of-Delta sale price of each year type.
RD 108 deliveries to the ranch	Not used in the model (Appendix D)	Reclamation District 108, 2026 Water Measurement Report	Table 3D, “Delivery to Fair Ranch,” 2013–2025; Table 3A, water wheeled to other users.
Contract terms	5,000 / 16,000 AF, 50% groundwater credit, 0.64 AF/ac cap, 2026–28 pause, remedies	DWR Grant Agreement 4600016769 (executed June 2026)	Forbearance Agreement (Exhibit D) §§ 2.b, 2.f, 6.a, 6.b.iii, 13.b–13.d (pp.39–55); Exhibit D-2 (pp.71–80).
Tract 6	Appendix C	Grant Agreement 4600016769: Exhibit A-1 (Tract 6 map, p.22 of 184); Exhibit D §§ 2.i, 6.b.iv, 12.a; Exhibit G (pp.175–178)	Crops: DWR / Land IQ Statewide Crop Mapping; parcels: Yolo County tax parcels; RD 108's contract and Drought Protection Program cut: Reclamation's EA, Table 2-1.

The model is Prairie Creek Labs' Fair Ranch compliance model. Its documentation lists every input with the contract page behind it.

Appendix A. The 25-year replay, year by year

Water year	Year type	River supply	Every eligible acre (AF)	2021 idling pattern, 40% (AF)
2000	Wet	Full supply	11,690	7,012
2001	Dry	Full supply, less HRL	10,746	6,068
2002	Dry	Full supply, less HRL	10,746	6,068
2003	Above Normal	Full supply, less HRL	10,746	6,068
2004	Below Normal	Full supply, less HRL	10,746	6,068
2005	Below Normal	Full supply, less HRL	10,746	6,068
2006	Wet	Full supply	11,690	7,012
2007	Dry	Full supply, less HRL	10,746	6,068
2008	Critical	Shasta Critical (75%)	8,767	4,090
2009	Dry	Full supply, less HRL	10,746	6,068
2010	Below Normal	Full supply, less HRL	10,746	6,068
2011	Wet	Full supply	11,690	7,012
2012	Below Normal	Full supply, less HRL	10,746	6,068
2013	Dry	Full supply, less HRL	10,746	6,068
2014	Critical	DPP Phase 1 year (51%)	5,968	1,290
2015	Critical	Shasta Critical (75%)	8,767	4,090
2016	Below Normal	Full supply, less HRL	10,746	6,068
2017	Wet	Full supply	11,690	7,012
2018	Below Normal	Full supply, less HRL	10,746	6,068
2019	Wet	Full supply	11,690	7,012
2020	Dry	Full supply, less HRL	10,746	6,068
2021	Critical	DPP Phase 1 year (51%)	5,968	1,290
2022	Critical	2022-type (18%)	2,104	0
2023	Wet	Full supply	11,690	7,012
2024	Above Normal	Full supply, less HRL	10,746	6,068

Appendix B. Rice acres by baseline year

Year	2016	2019	2023	2024	Average
Rice acres	2,443	1,927	2,331	3,197	2,474

Appendix C. RD 108's Tract 6 and the Tract 6 model

Reclamation District 108 (RD 108) is a party to the Fair Ranch agreement and is buying the ranch: once the purchase is complete, every reference to the Owner means RD 108 (§ 12.a). It also owns farmland of its own, Tract 6, which it leases to farmers: about 7,000 annually irrigated acres (6,947), 98% of them rice, directly west of and adjoining the ranch between the Colusa Basin Drain and the Sacramento River (Figure C1). Its water comes from RD 108's own Settlement Contract with Reclamation (contract 876A-R-1: 232,000 acre-feet a year, 199,000 of base supply plus 33,000 of Project Water, Exhibit A) and RD 108's own water rights, not from the ranch's 29,800 acre-foot contract.

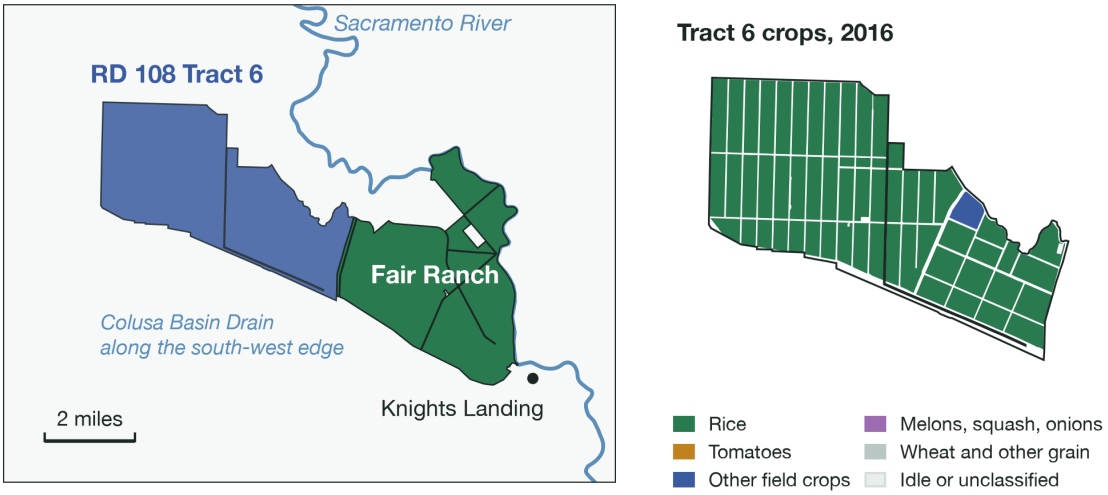


Figure C1. RD 108's Tract 6 beside Fair Ranch (left), and Tract 6's crops in 2016 (right). Tract 6 is shown as the 22 tax-exempt Yolo County parcels west of and adjoining the ranch; the county parcel layer has no owner field, so RD 108 ownership is inferred. Sources: the contract's Tract 6 map (Exhibit A-1); Yolo County parcels; USGS National Hydrography Dataset; DWR/Land IQ Statewide Crop Mapping 2016.

Why it is in the contract

The grantee's proposal (Grant Agreement 4600016769, Exhibit G) names Tract 6 as the fallback for groundwater substitution, which the contract bars in 2026–28 and caps afterward (section 7):

> In the event of circumstances that may prevent the use of groundwater substitution historically relied upon in part to make water available for transfer from the Fair Ranch, RD 108 would jointly manage Fair Ranch with lands it owns within RD 108, known as Tract 6, to

> meet the Project Objective without interfering with the current viability of RD 108's interest in Tract 6.
>
> *Grant Agreement 4600016769, Exhibit G, Proposal Objective, p. 175 of 184*

The contract turned that into a duty to coordinate, in good faith:

> RD 108 Coordinated Implementation Actions. Upon the RD 108 Acquisition (as defined below), as necessary to ensure the annual production of the Minimum and Expected Volumes, RD 108 will jointly and in good faith coordinate management of the Property and RD 108's separate Tract 6 property, including any applicable rights under the RD 108 Settlement Contract, , with all related water producing actions specified in the annual Water Use Forbearance Plan, without interfering with the current viability of RD 108's interest in Tract 6.
>
> *Forbearance Agreement § 6.b.iv (PDF pp. 44–45). The double comma is in the executed text.*

How the Tract 6 model counts it

Because there are no delivery accounting rules written into the Fair Ranch contract for Tract 6, any modeling of Tract 6 must make assumptions around what these rules are. The Tract 6 model counts Tract 6 exactly as Exhibit D-2 counts Fair Ranch: a crop-mix baseline from the non-transfer years 2016, 2018, 2019, 2020, 2023 and 2024 (Figure C2), the White Paper's frozen rate for each crop, every eligible acre available to idle, rice idled first, and the same short-supply rules. Its supply is Tract 6's share of RD 108's contract by acreage (16.5%, 38,288 acre-feet in a full year), cut 25% in a Shasta Critical year, by RD 108's own 55,555 acre-feet in a Drought Protection Program year, and to 18% in a 2022-type year. Tract 6 also carries its share of RD 108's HRL commitment (1,749 HRL acre-feet, 1,179 of credit). Idling every acre would credit 19,884 acre-feet in a Wet year.

What it would take. Closing the gap to 16,000 AF would mean idling 1,486 to 5,779 of Tract 6's ~7,000 irrigated acres, depending on the year:

Year type	Fair Ranch delivers (AF)	Gap to the 16,000 AF target (AF)	Tract 6 acres to idle to close the gap
Wet	11,690	4,310	1,486
Above Normal, Below Normal, Dry	10,746	5,254	2,218
Shasta Critical	8,767	7,233	2,686
Drought Protection Program	5,968	10,032	5,779
2022-type (18% supply)	**2,104**	**13,896**	**not reachable**

In a 2022-type year Tract 6 would have to idle 6,256 of its 6,947 acres just to lift Fair Ranch to the 5,000 AF floor, and 16,000 AF is out of reach: all of Tract 6 alone yields 4,639 AF in a 2022-type year.



Figure C2. Crops on Tract 6 in its six baseline years: almost all rice. DWR / Land IQ Statewide Crop Mapping (2024 provisional), clipped to the 22 parcels.

Why it is not in our totals

- **No volume.** § 6.b.iv is a duty to coordinate "in good faith" and "as necessary." It sets no volume and no acreage.
- **An opt-out for RD 108.** RD 108 need not do anything that interferes with "the current viability of RD 108's interest in Tract 6." The term is not defined, and Tract 6 is leased farmland whose rent funds the district, which leaves the call to RD 108.
- **No rule for counting it.** Compliance is measured only by Exhibit D-2 (§ 6.b.v.2), which accounts for water "from the Fair Ranch Property" and never mentions Tract 6. Any Tract 6 action would have to be written into the yearly Water Use Forbearance Plan and accepted by DWR.
- **No remedy.** The remedies attach only to the 5,000 AF Minimum Volume (§ 13.c.i).

Tract 6 is the one part of the deal that could, in principle, bring the ranch toward 16,000 acre-feet. But the contract leaves that to RD 108's choice, at the cost of its own rental income, and gives no way to count the result. The model therefore credits nothing from Tract 6.

Sources: Grant Agreement 4600016769, Exhibit A-1, Exhibit D (Forbearance Agreement) §§ 2.i, 6.b.iv, 6.b.v.2, 12.a, 13.c.i and Exhibit D-2, Exhibit G (grantee's proposal); DWR / Land IQ Statewide Crop Mapping; Yolo County parcels; Reclamation, Drought Protection Program EA, Table 2-1; Prairie Creek Labs Tract 6 model.

Appendix D. Not in the model: RD 108's recent deliveries to the ranch

Reclamation District 108, a party to the contract, delivers water to Fair Ranch. Its 2026 Water Measurement Report lists those deliveries each year. In recent years they have been much

smaller than the 18,459 acre-feet the model assumes the ranch's crops take from the river in a full year:

Year	Year type	Delivered by RD 108 (AF)	Share of the model's 18,459 AF	Note
2016	Below Normal	5,533	30%	baseline year
2017	Wet	5,987	32%	
2018	Below Normal	6,140	33%	transfer year
2019	Wet	4,534	25%	baseline year
2020	Dry	8,092	44%	transfer year
2021	Critical	0	0%	transfer year
2022	Critical	2,647	14%	18% supply
2023	Wet	10,755	58%	baseline year
2024	Above Normal	12,167	66%	baseline year
2025	Above Normal	9,508	52%	

RD 108, 2026 Water Measurement Report, Table 3D, "Delivery to Fair Ranch" (calendar years). Table 3A books the same water as "Water Delivered to Other Users." The report does not say whose contract the water was delivered under.

In the four baseline years whose crops the model uses, RD 108 delivered 8,247 acre-feet on average, about half of 18,459. Its largest delivery, 12,167 acre-feet in 2024, was 66% of it. In 2025 it delivered 9,508, less than the 11,690 the model credits in a Wet year.

The model does not use these figures. Under the contract, the credit depends on the crops that would have been grown and the White Paper's fixed rates, not on how much water was delivered. We point them out because they leave two possibilities. Most likely, the ranch gets most of its river water from its own direct diversions under River Garden Farms' Settlement Contract. Or its crops took much less river water than the model assumes, and the credit could exceed the water the ranch actually took from the river: the State would be paying, in part, for water that was never diverted. Settling this would require River Garden Farms' own diversion records, which we have not found.