

No Fence, No Turnout? Rethinking Post-Fire Allotment Grazing Options

Matt and Elena Cruz* operate a 350-pair cow-calf ranch in the foothills of the western mountains. Each summer, they utilize the Red Springs federal grazing allotment under an annual grazing permit. The allotment includes about 4,500 acres of mixed sagebrush, grass benches, and broken draws. In a normal year, the Cruz cattle use the allotment from mid-May through mid-August.

Late last August, a lightning-caused rangeland fire burned about 1,200 acres in the lower part of the allotment. The fire also destroyed 2.1 miles of interior, pasture fence that the federal agency used to separate the burned unit from the rest of the allotment. Posts were burned, brace corners failed, and much of the wire was no longer usable, Figure 1.

About 3,300 acres of the allotment did not burn and still had usable forage for the coming grazing season. The problem was not whether cattle could graze the entire allotment. Under the post-fire rest requirement, the burned unit could not be grazed during the coming season. The question was whether the Cruz operation could keep cattle out of the burned area, while still using the unburned part of the allotment.

Agency range staff told the Cruz family that the burned unit needed rest during the first growing season after the fire. The agency was open to a short, documented Virtual Fence (VF) trial if the producer could show a mapped exclusion boundary, a monitoring plan, and a clear cattle-removal strategy if a breach occurs. If those conditions could not be met, the Cruz family would need to rebuild the physical fence before turnout or find replacement forage elsewhere.

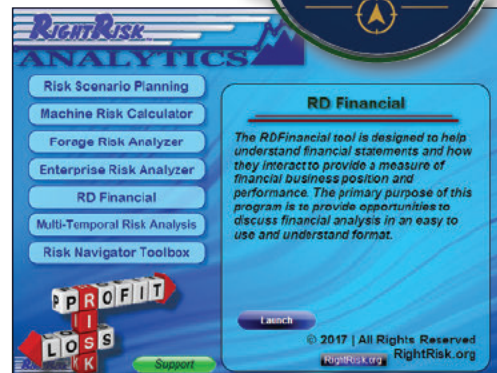
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Allotment Burn Response Decision

The Cruz family had four basic choices before May turnout:

1. Rebuild the burned interior fence before turnout
2. Delay use of the entire allotment and find replacement pasture or feed
3. Use riders, salt placement, and temporary electric fence to hold cattle off the burned area
4. Implement a Virtual Fence system for a 90-day trial to graze the unburned forage, while excluding cattle from the burned area



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The fourth option did not mean replacing the boundary fence or making a permanent technology commitment. It meant using VF as a time-bounded management test on one clearly defined problem: keep cattle off the burned area of the unit while retaining use of the unburned forage.

Risk Mitigation Filter Screening Summary

The *Risk Mitigation Filter* (RMF) is a compact screening tool that lets a producer rate fencing and grazing alternatives against eight risk-relevant criteria to identify which options warrant deeper analysis. The Cruz family completes the RMF for four responses they are considering, Table 1. (See ARA-20260608.262, for more on using the *Risk Mitigation Filter*.)

Status quo (no change): Problem Fit: Poor (P); Risk Source: Institutional/legal (I)/ Production (P); Control Type: Accept (A); Feasibility: Infrastructure-Yes (Y), Labor-Yes (Y), Legal-Yes (Y), Animal Management-Yes (Y), Contingency-Yes (Y); Up-Front Cost: Low (L); Recurring Cost: Low (L); Failure Consequence: High (H); Next Step: Reject from comparison.

Permanent physical fence repair: Problem Fit: Strong (S); Risk Source: Institutional/legal (I) / Financial (F); Control Type: Avoid (A); Feasibility: Infrastructure-Yes (Y), Labor-Contingency (C), Legal-Yes (Y), Animal Management-Yes (Y), Contingency-Yes (Y); Up-Front Cost: High (H); Recurring Cost: Low (L); Failure Consequence: Low (L); Next Step: RSP Tool.

Temporary electric fence plus rider: Problem Fit: Moderate (M); Risk Source: Human (H) / Production (P); Control Type: Reduce Probability (RP); Feasibility: Infrastructure-Contingency (C), Labor-Contingency (C), Legal-Contingency (C), Animal Management-Contingency (C), Contingency-Yes (Y); Up-Front Cost: Moderate (M); Recurring Cost: Moderate (M); Failure Consequence: High (H); Next Step: RSP Tool.

Delay turnout and replace forage: Problem Fit: Poor; Risk Source: Financial (F) / Production (P); Control Type: Avoid (A); Feasibility: Infrastructure-Yes (Y), Labor-Yes (Y), Legal-Yes (Y), Animal Management-Yes (Y), Contingency-Yes (Y); Up-Front Cost: Low (L); Recurring Cost: High (H); Failure Consequence: Low (L) for agency compliance but High (H) for ranch cost; Next Step: Filter Sufficient.

Virtual Fence 90-day trial: Problem Fit: Strong (S); Risk Source: Institutional/legal (I) / Human (H); Control Type: Reduce Probability (RP); Feasibility: Infrastructure-Contingency (C), Labor-Contingency (C), Legal-Contingency (C), Animal Management-Contingency (C), Contingency-Yes (Y); Up-Front Cost: Moderate (M); Recurring Cost: Moderate (M); Failure Consequence: High (H); Next Step: RSP Tool.

The RMF screening did not end once the form was completed. The VF trial showed a strong problem fit, but four conditions were still unknown going into the decision: whether the agency would accept a VF trial in place of rebuilt fence, whether the system would perform reliably on this allotment, whether the family had enough labor to respond to breaches, and how many grazing days they could actually keep if the trial ran into problems. With that much still unresolved, the filter pointed to a deeper analysis, rather than a final answer.

Figure 1. Burn Area - Red Springs Allotment

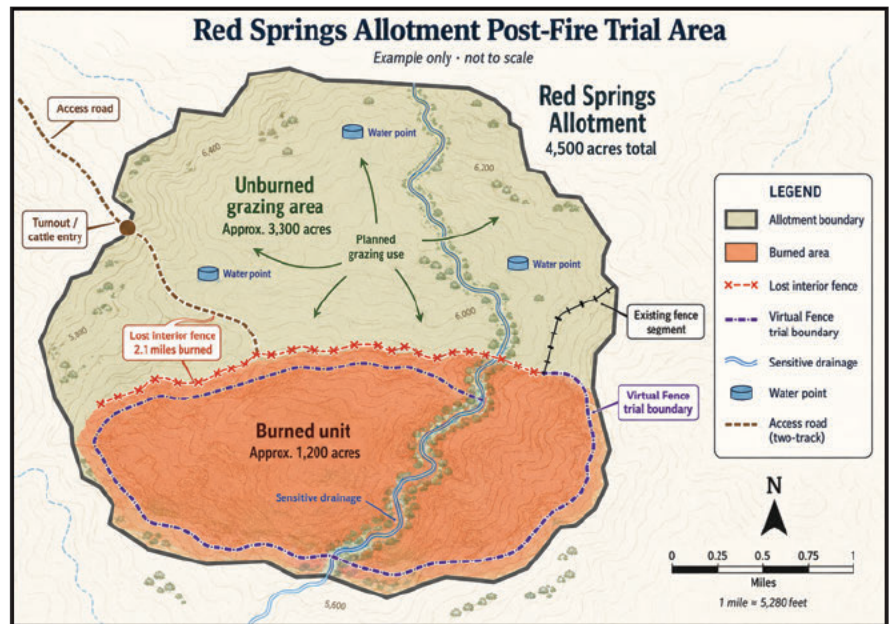


Table 1. Risk Mitigation Filter Entries for Red Springs Allotment: Status Quo and Four Other Responses

Alternative (up to 5 named)	Problem Fit S/M/C/P	Risk Source M•P•I•H•F underline primary	Control Type Av•RP•RC•Tr•Ca•Ac underline primary	Feasibility I•L•Lg•A•C underline primary	Up-front Cost L/M/H/C	Recurring Cost L/M/H/C	Failure Consequence L/M/H	Next Step tool/specialist or "filter ok"
Status quo (no change)	P	<u>I</u> P	Ac	YYYYY	L	L	H	Reject from comparison
Permanent physical fence repair	S	<u>I</u> F	Av	YCYYY	H	L	L	RSP Tool
Temporary electric fence plus rider	M	<u>H</u> P	RP	CCCCY	M	M	H	RSP Tool
Delay turnout and replace forage	P	<u>F</u> P	Av	YYYYY	L	M	L - agency H - ranch	Filter Sufficient
Virtual Fence 90-day trial	S	<u>I</u> H	RP	CCCCY	M	M	H	RSP Tool

Risk Scenario Planning Tool

The *Risk Scenario Planning* (RSP) tool is a partial budgeting tool designed like a typical partial budget; it includes sections for added and reduced costs and returns. What sets the RSP tool apart is its analysis section, which allows users to incorporate risk using one or two uncertain variables in their estimates. This feature enables users to input a range of forecast values—minimum, maximum, and most likely values—for the uncertain variables, generating a probability distribution that illustrates the breadth of potential outcomes. Based on the variables entered, the RSP tool produces estimates of the net benefit, along with the associated probabilities.

The RSP tool fits this case because the decision is short-term, bounded, and uncertain. The Cruz family is not yet comparing a permanent multi-year investment. They are testing whether a 90-day VF trial can reduce use of the burned area enough to allow grazing on the rest of the allotment for one season.

RSP Partial Budget Setup

The proposed change is the 90-day VF trial compared with not using the federal allotment until enough physical fence can be rebuilt. The partial budget includes only items that change because of the proposed change.

Positive effects – Reduced Costs

- Reduced replacement forage or pasture cost: 350 pairs for 3 months [$350 \times (90 \text{ days} / 30 \text{ days/month}) = 1,050$ pair-months at \$35 per pair per month = \$36,750 total
- Reduced emergency fence-repair premium: \$8,000 total. This represents the estimated rush-cost premium avoided if full fence repair can be scheduled later rather than completed before turnout

Negative effects – Added Costs

- VF system access, collars, base-station equipment, data service, and technical support for 90 days. (Note: lease-model pricing and a single base station may reduce this total for 350 pairs): \$24,000 total
- Collar installation, training period labor, and pre-turnout handling: \$4,800 total
- Labor for cattle monitoring and removal following breach: \$1,000 total
- Management time working with agency to document and map boundaries: \$1,200 total

Estimated Net Benefit Before Risk Analysis

- Positive effects: \$44,750 total
- Negative effects: \$31,000 total
- Estimated net benefit: \$13,750 total

This point estimate is not the decision. It only shows what the budget looks like before uncertainty is added. The RSP Tool is used because several values could vary enough to change the interpretation.

Uncertain Values for the RSP Tool

Uncertain Value 1 - Grazing-Use Days Retained:

This value represents how many of the planned 90 grazing days the Cruz family can keep using the unburned part of the allotment. If the VF trial works well and the agency remains satisfied, the value is near the full 90 days. If repeated breaches occur and the cattle must be removed early, the value falls.

- Minimum: 45 days retained or $350 \times (45 \text{ days} / 30 \text{ days/month}) = 525$ pair-months
- Most likely: 75 days retained or $350 \times (75 \text{ days} / 30 \text{ days/month}) = 875$ pair-months
- Maximum: 90 days retained or $350 \times (90 \text{ days} / 30 \text{ days/month}) = 1,050$ pair-months

This value affects the reduced cost side of the partial budget.

Uncertain Value 2 - Reduced Emergency Fence-repair premium:

This value captures an estimate of the rush-cost premium avoided if the Cruz family can postpone the full repair until after turnout pressure has passed. The trial may avoid the whole rush premium, only part of it, or none of it if the agency still requires immediate work.

- Minimum: \$0
- Most likely: \$4,000
- Maximum: \$8,000

This value affects the reduced cost side of the partial budget.

RSP Tool Results

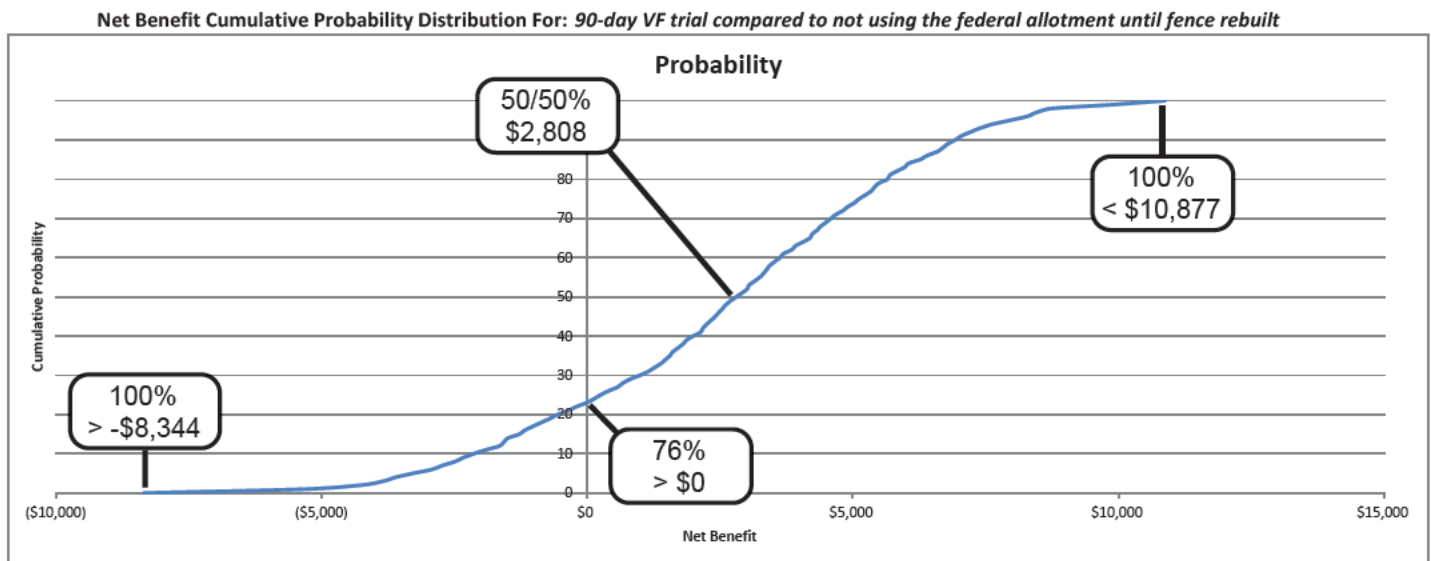
The RSP tool generates results based on repeated random draws (1,000 total draws) from the distributions of uncertain grazing days and reduced emergency fence-repair premium, allowing those values to vary within their respective ranges. The result is a probability graph describing a range of possible net benefits for the 90-day VF trial the Cruz family should expect, Figure 2.

The 50/50 or most-likely value was \$2,808, meaning that half of the simulated outcomes were above that amount and half were below it. The low-end result was -\$8,344, while the high-end result was \$10,877. The variability in this analysis range comes from allowing grazing-use days retained and the reduced fence-repair premium to vary, which means that the decision hinges mainly on whether the cattle can remain on the unburned part of the allotment long enough to preserve forage value and/or whether the estimate for reduced emergency fence-repair premium is close.

It is worth noting that both of these factors appear on the positive effects or benefits side of the budget for a VF trial. This is often the area of greatest uncertainty around the adoption of virtual fencing. Variation in other factors could also change the outcome and should be carefully considered before any final decision is made.



Figure 2. Cruz Family Risk Scenario Planning Results - Red Springs Allotment



Uncertain Value 1: grazing-use days retained

Uncertain Value 2: Reduced emergency fence-repair cost

If the low-end result remains acceptable to the Cruz family and the agency, the analysis supports a Trial Outcome. If the low-end result creates unacceptable cost or compliance exposure, the case would shift toward physical fence repair or delayed turnout.

Interpreting the result

The RSP analysis does not prove that VF will solve the post-fire grazing problem. It shows how much financial and management room the Cruz family has if the trial performs better or worse than expected.

The trial becomes more attractive when most of the grazing days are retained and the avoided rush-repair premium outcomes are near the high end of the range, and less attractive if cattle must be removed early or if little of the rush premium can be avoided.

This is why the decision outcome is Trial, not Partial Adoption or Full Adoption. The Cruz family is testing one short-season use of VF under agency review. A permanent decision would require a different analysis after the trial data are available.

Decision outcome

Based on the RMF screen and the RSP setup, the case reaches a Trial outcome. The Cruz family does not adopt VF for the entire operation. They also do not reject it. They agree to a 90-day, agency-reviewed pilot on one federal allotment problem: excluding cattle from the burned area while allowing use of unburned forage.

The trial is justified because it is bounded, reversible, monitored, and tied to clear failure triggers. The final decision after the season depends on actual cattle behavior, agency acceptance, monitoring workload, and whether the avoided replacement-forage cost was high enough to justify the VF costs.

What remains uncertain

Several uncertainties remain after the RSP analysis:

- Whether the VF boundary works reliably in the specific topography of the burned allotment
- Whether the cattle respect the burned-area boundary once forage conditions change during the season
- Whether cattle monitoring and removal labor stays within the Cruz family's available time
- Whether agency staff remain comfortable with VF as a temporary post-fire management tool after observing trial performance
- Whether physical fence repair is still needed before the next grazing season

Further analysis

If the Cruz family only requires a single-season response, the *RSP Tool* analysis is enough for this case. If they begin evaluating VF as a recurring tool on this or other federal allotments, the decision changes. A multi-year investment with recurring costs, replacement cycles, and different cost structures would require evaluation using the *Multi-temporal Risk Analyzer (MTRA)* tool.

Agency-specific permit conditions, legal fence status, liability, and cost-share eligibility remain specialist topics. They should be addressed directly with the responsible federal agency, Extension personnel, and other qualified advisors before any permanent implementation decision.

For More Information

Visit VirtualFence.RightRisk.org for more details on how the *Risk Mitigation Filter* and *Risk Scenario Planning* tools can assist in risk management planning for your operation. RightRisk.org offers a wide range of budgeting tools, courses, producer profiles, and other resources designed to help producers understand and manage risk, ensuring their operations thrive.

* The Cruz operation is a case study example created to demonstrate RightRisk tools and their applications. No identification with actual persons living or deceased, places, or agricultural operation is intended nor should be inferred.

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