# Challenges in Prospective Temporary Fallowing of Irrigated Agriculture in the Upper Colorado River Basin

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*December, 2011*

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## Introduction

Between July and September 2011, the Environmental Defense Fund (EDF) conducted a study exploring ranchers' thoughts on the feasibility of implementing a voluntary and compensated rotational fallowing (or deficit irrigation) program in the Upper Colorado River Basin. Ranchers in the Upper Green and Yampa River Valleys in Wyoming and Colorado were interviewed to find out if periodic, voluntary and compensated fallowing of irrigated forage crops and pasture would be a possibility for their operations. Questions were not based on a specific program proposal, but were meant to elicit both general reactions and detailed explanations of factors that would play into their decision-making processes.

The interviews raised a number of issues of critical importance to ranchers that must be resolved for such a program to be feasible. EDF believes that demonstration programs, research and cooperative discussions among ranchers, conservationists, and other water users can produce solutions on these issues.

## Methods

Primary data for this report was collected through in-depth, semi-structured interviews with ranchers (who grow primarily grass hay and alfalfa) and other local experts, including extension agents, water commissioners, water-rights consultants, and local non-profit staff. Twenty-one interview subjects were identified through personal contacts.

## Results

Ranchers primarily responded negatively to questions about participation in a compensated, rotational fallowing (or deficit irrigation) program. All but two interviewees indicated they would likely not be interested in such a program due to various operational, financial, legal or other factors, as discussed below.

General concerns included questions about the efficacy of such a program at the individual scale, whether this type of program would make more sense for traditional crop agriculture systems, and the feeling that water and money are not equivalent. Or as one rancher put it: "Money is not an equal replacement for water. Water is necessary!"

In addition to these general responses, ranchers described a number of interrelated factors essential to their decision-making. These responses can be divided into the following categories: ***operational, financial, temporal, hydrologic, personal, community and regional, and legal and institutional***.

The most frequently raised concerns were the **potential negative effect on fields and herd size and composition; larger-scale effects on return flows, recharge, downstream users, wildlife, and regional aesthetics and tourism; and the limitations of current water law**. Both ranchers and other experts also noted that further research would be needed to test the long-term effects of non-irrigation on grass hay and alfalfa.

Including landholders and other local stakeholders from a variety of sectors will be critical for any effort involving temporary fallowing or deficit irrigation programs, as relationships and trust between parties to such transactions are fundamentally important. And, as one rancher put it, "It's important to ranchers that they are the ones to make the decision. They don't like to be forced."

Finally, the interviews clearly highlighted that each landholder, each operation, and each piece of land are different. Precipitation patterns, hydrology, and geology can vary drastically within a small geographic area, and ranchers and farmers have very site-specific knowledge on which they base their decisions.

### *Operational Factors*

Damage to the crop or fields: Ranchers expressed mixed opinions about the potential effect of non-irrigation on their operations. For those who expected negative impacts, weed and tree encroachment, plant death, the potential for bare ground, and recovery time were cited. As one rancher explained, "If you don't irrigate, you do some damage to the crop, which takes a couple years to rebuild. For that reason, most producers would be reluctant to take part in this type of program."

Other ranchers foresaw less of a problem with weeds, particularly due to adequate snow moisture in some areas, and some admitted not knowing what the impact of non-irrigation would be on their hay meadows. Deficit irrigation, however, could be one way to avoid the negative affects of non-irrigation, as at least two ranchers thought it would be feasible to minimally irrigate and maintain field health (though this would not necessarily be enough water to support a hay crop).

Can't "fallow" hay: Unlike traditional crop agriculture (using annuals), ranchers noted that they cannot actually "fallow" irrigated hay. One rancher in the Yampa Basin (where the major crop is grass hay) stated, "You can't fallow that [hay]. It will always grow. You just grow less." As such, even in years of non-irrigation, ranchers could still endure the cost of maintaining their fields (e.g., to prevent "thatching").

Implications of reduced forage production: With less forage available, ranchers would then likely need to purchase and/or stockpile hay to sustain their herds.

Thus, payments to ranchers would need to cover this cost; however, the price of hay is unpredictable and can be dependent on conditions outside the region.

Irrigated pasture: For ranchers who irrigate pastures for grazing, non-irrigation can lead to unique operational constraints, including lack of space and feed for yearlings (year-old cows) and an inability to use those pastures for their dedicated function (e.g., keeping certain livestock apart, etc.).

Stockpiling: In theory, ranchers who knew in advance that they would be foregoing irrigation might be able to stockpile some forage in order to minimize the amount they would need to purchase. However, this scenario would only work if a rancher has extra hay or alfalfa to put aside, as well as the infrastructure to store it, which is not always available. The quality of stored forage also deteriorates with time.

Equipment and irrigation infrastructure: Maintenance of irrigation equipment and infrastructure was cited as a concern – even during non-use.

Herd size, genetics, and recovery: For many of the ranchers interviewed, reduced forage growth would lead to reductions in herd size, which has implications for economics, herd genetics, replacement (i.e., desired breeds aren't available everywhere, and new cattle will not be acclimated to their surroundings), and the continuation of ranching operations. One rancher stated: "We wouldn't have the forage. After you've reduced, it's expensive to re-stock, which takes away from the bottom line." And another explained that, "You'd either have to buy hay or sell cows. Then you'd lose the genetics you've worked 20-30 years on." Another rancher explained that not irrigating would cut his carrying capacity by 80 percent, which would "retire" him, and he "doesn't want to do that for minimum wage."

Yearlings: Though most of the ranchers interviewed run cow-calf operations, some did note that this type of arrangement could be easier for people who run yearlings, because, as one rancher put it, "it's an easy in and out."

Operational vulnerability: When the aforementioned factors are experienced in combination, ranchers expressed concerns about the likelihood of increased operational vulnerability, as well as a hesitation to make changes to systems that are already well developed.

### *Financial Factors*

Though not a primary point of discussion, some ranchers did have thoughts on additional financial factors that would need to be considered, including: ongoing debt payments, the desire to make a profit, the cost of replacing hay and pasture, the impact on idle machinery, and the time it would take for fields to recover.

### *Temporal Factors*

Ranchers expressed differing opinions, and there was not agreement about the feasibility of fallowing during drought, during wet years, and the timing of fallowing decisions.

### *Hydrologic Factors*

Return flows, recharge, and downstream users: One of the most common factors interviewees discussed was the importance of irrigation, particularly flood irrigation, for return flows, recharge, downstream users, and water quality. Several ranchers explained that water from flood irrigation often fills gravel beds, providing late season stream flows.

Sprinklers/efficiency: Though ranchers were not asked specifically about water conservation or efficient irrigation technology, a number of ranchers did broach the subject. Some wanted to include water conservation in the discussion, while others used sprinkler irrigation to illustrate the impact of diminished return flows, citing cases on the Tongue and Arkansas Rivers.

### *Personal Factors*

Uncertainties: Numerous ranchers discussed uncertainties and distrust, particularly the concern about creating demand or setting a precedent, as factors in their decision-making. According to one rancher, "Ranchers have water and everyone else wants it, so they're somewhat suspicious. There's also fear about showing that they don't need it, even in some years." Another rancher says he's concerned that people might become dependent on the water and say, "You let us have it the last five years, so now we don't want you to take it away."

End use/other water users: Ranchers also questioned, and expressed concern about, the end use of the water in this scenario – and wondered whether other parties, such as cities or industries, would also be asked to make changes in their behavior. One rancher noted: "There's no way on principle that we would participate in this type of program as long as there are green lawns in cities." He thinks that most ranchers are willing to sacrifice ("probably more than most") as long as other people are sacrificing too. This is their livelihood, how they make their money, he says, "so it's hard when people in Denver want water for aesthetics."

### *Regional and Community Factors*

Habitat and wildlife: In addition to other factors, many of the ranchers interviewed also mentioned the negative impact that stopping or reducing irrigation would have on habitat, ecosystems, and wildlife in the area that are supported by irrigation and irrigation return flows.

In-stream flows: A few ranchers also discussed in-stream flows – both their importance for recreation and the environment and potential restrictions by agencies holding junior in-stream-flow rights.

Aesthetics, fishing industry, and tourism: Ranchers also expressed their belief that ceasing or reducing irrigation would affect tourism, fishing, and the general aesthetic appeal of the areas in which they operate. According to one rancher, "Losing the meadows would also kill the tourism. It would turn the area into a desert. It would just kill those areas. People like the irrigated meadows for the ambiance. Steamboat sells itself as a 'cow town.' " He also has a fishing business (leasing fishing rights), so for him, "water means double or triple the income."

Other industries: Other industries could also be affected by reduced irrigation, though the impacts would clearly differ by community. "You would definitely have a negative impact on local agriculture industries. You would stop hiring labor, and stop selling hay to local people," said one rancher. Another stated: "If you don't irrigate, you don't put up hay, you don't use the equipment, and you don't need to buy fertilizer and parts."

### *Legal and Institutional Factors*

Leased land: When asked how different land-tenure arrangements (particularly private leases) could affect their decision to participate in a compensated, rotational fallowing program, some ranchers interviewed expressed concerns, while others thought there would be no effect (though they asserted that they would still need to make sure to maintain the water rights on those leases).

Tax classification: Two ranchers also mentioned the problems that could potentially arise from forgoing irrigation on land that is classified as "irrigated land" for tax purposes, though others mentioned that they didn't think it would actually pose a problem. According to one rancher, "In order to do this, ranchers would need to not pay taxes based on irrigated land values." Another stated, "Long-term, people would have to justify to the County Assessor that it's not a hay meadow any more, it's a pasture. That would take two to three years of having cows on it, and the monetary difference would be minimal."

Water rights: Ranchers in both states also expressed concerns about current water law and the limitations it would place on participation in such a program. As one rancher stated, "In a highly administered system, individuals don't have the option to participate in such a system. If you don't use your water, the next guy is going to." Another stated, "To be allowed to do this, you'd have to change Wyoming state law. No question." And another said, "One other factor to consider is that you have to use your water once every ten years so that it's not subject to abandonment. Abandonment could be a consideration."

Other institutions: Two ranchers raised questions about conservation easements, wondering whether land trusts would have any concerns about landowners leasing irrigation rights.

### *Expert Thoughts*

Extension agents, water officials and experts, and local non-profit staff in the two areas were also asked for their thoughts on this type of compensated, rotational fallowing system. Their comments echoed those from landowners, including discussions of the importance of return flows, the importance of water to agriculture, the likelihood of re-appropriation by junior water users downstream, potential financial and operational constraints, fear, and the parallels that exist with conservation easements.