SUBMIT OPTION SUBMITTAL FORM BY:

1. EMAIL TO: COLORADORIVERBASINSTUDY@USBR.GOV
2. U.S. MAIL TO: BUREAU OF RECLAMATION, ATTENTION MS. PAM ADAMS, LC-2721, P.O. BOX 61470, BOULDER CITY, NV 89006-1470
3. FACSIMILE TO: 702-293-8418

Option Submittal Form

Contact Information (optional): ☐ **Keep my contact information private.**

Contact Name: _____ Title: _____

Affiliation: _____

Address: _____

Telephone: E-mail Address:

Date Option Submitted: 1-28-2012

Option Name:

Agricultural Field Restoration Utilizing Native Grasses

Description of Option:

Native grasses require approximately 50% or less total volume of water per acre than many traditional agricultural crops such as alfalfa and cotton. The native grass crop can be used as forage, cover or harvested for hay for feed or seed banking. Conversion of existing crops to native grasses will result in; reduced consumptive use of water, reduction of long term expense and operational resiliency in the face of drought.

Location: Describe location(s) where option could be implemented and other areas that the option would affect, if applicable. Attach a map, if applicable.

Conversion of existing alfalfa, cotton and other traditional agricultural crops to native grasses is being performed on a small scale in arid landscapes including Arizona, New Mexico and California.

Quantity and Timing: Roughly quantify the range of the potential amount of water that the option could provide over the next 50 years and in what timeframe that amount could be available. If option could be implemented in phases, include quantity estimates associated with each phase. If known, specify any important seasonal (e.g., more water could be available in winter) and/or frequency (e.g., more water could likely be available during above-average hydrologic years) considerations. If known, describe any key assumptions made in order to quantify the potential amount.

The range of the potential amount of water that the option could provide over the next 50 years is considerable. Field study results indicate a minimum of reduction in water use of 50% with the native grass crop as opposed to traditional alfalfa. According to “Comparing Costs and Efficiencies of Different Alfalfa Irrigation Systems” by B.Sanden, K.Klonsky, D.Putman, L. Schwankl and K.Bali, alfalfa requires between 4.0 and 4.5 acre feet per acre per year. Therefore, a reduction in water use with the native grass crop would indicate and approximate reduction and resulting conservation of 2.0 acre feet per acre per year. Application of the native grasses as a crop basin wide would lead to considerable reduction in water use along with a more resilient and drought tolerant crop.

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Additional Information

Technical Feasibility: Describe the maturity and feasibility of the concept/technology being proposed, and what research and/or technological development might first be needed.

The native grass crop is an existing option for water conservation, crop resiliency and sustainable agriculture. Methods of change over, seed sources and continued operational protocol are currently documented as well as the topic being an ongoing focus of research by individuals and institutions. The existing documentation and field trials indicate the conversion of high water use crops to native grasses is a feasible option.

Costs: Provide cost and funding information, if available, including capital, operations, maintenance, repair, replacement, and any other costs and sources of funds (e.g., public, private, or both public and private). Identify what is and is not included in the provided cost numbers and provide references used for cost justification. Methodologies for calculating unit costs (e.g., $/acre-foot or $/million gallons) vary widely; therefore, do not provide unit costs without also providing the assumed capital and annual costs for the option, and the methodology used to calculate unit costs.

The cost of converting fields to native grasses is variable depending on; seed availability, existing conditions of the field to be converted and methods of seeding. The initial cost of conversion can be amortized over a number of years as alfalfa needs to be replanted on a 3 to 7 year rotation whereas native grasses are usually seeded only once and then the field is allowed to mature. Many other high water use crops are annual therefore the seeding expense is an annual event. The native grasses are perennial and, once established, have a long life span with no need to reseed.

Permitting: List the permits and/or approvals required and status of any permits and/or approvals received.

None known.

Legal / Public Policy Considerations: Describe legal/public policy considerations associated with the option. Describe any agreements necessary for implementation and any potential water rights issues, if known.

It is important to note that in most states in the basin, water users are not able to market or expand their operations with conserved water, and thus the adoption of conservation practices is not as prolific as might be expected in an arid region.

Implementation Risk / Uncertainty: Describe any aspects of the option that involves risk or uncertainty related to implementing the option.

The policy and application considerations listed above are significant. In addition, while native grasses have a variety of values, a market for native grass is not yet well developed so producer returns are unclear. However if these could be adequately addressed, conversion to native grass and other low water use crops to conserve water is a low-risk proposition. One of the crops developing in conjunction with the grass crop is grass fed beef and that does have a good market and has received significant support.

Reliability: Describe the anticipated reliability of the option and any known risks to supply or demand, such as: drought risk, water contamination risk, risk of infrastructure failure, etc.

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Conversion of high water use crops to native grass provide extremely reliable savings of water and operational drought tolerance.

Water Quality: Identify key water quality implications (salinity and other constituents) associated with the option in all of the locations the option may affect.

The grasses utilize less water therefore reducing salinization of the soils. The grasses require less fertilizer reducing application and therefore runoff of fertilizer products.

Energy Needs: Describe, and quantify if known, the energy needs associated with the option. Include any energy required to obtain, treat, and deliver the water to the defined location at the defined quality.

Energy Required	Source(s) of Energy
Aside from small energy requirements of initial conversion and planting, energy needs are comparable to or lower than needs of existing agricultural irrigation.	

Hydroelectric Energy Generation: Describe, and quantify if known, any anticipated increases or decreases in hydroelectric energy generation as a result of the option.

Location of Generation	Impact to Generation
	May lead to nominal increases in hydropower generation, to the extent that conserved water remains instream and passes through turbines.

Recreation: Describe any anticipated positive or negative effects on recreation.

Location(s)	Anticipate Benefits or Impacts
	To the extent that broad-scale conversion to lower water use crops would reduce the quantity of water diverted for agricultural use, river recreation resources would be expected to improve.

Environment: Describe any anticipated positive or negative effects on ecosystems within or outside of the Colorado River Basin.

Location(s)	Anticipated Benefits or Impacts
	To the extent that broad-scale conversion to lower water use crops would reduce the quantity of water diverted for agricultural use, river environmental resources would be expected to improve.

Socioeconomics: Describe anticipated positive or negative socioeconomic (social and economic factors) effects.

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As noted above in the section on legal/public policy concerns, the costs of conversion to native grass and other low water use crops at a broad scale needs to be shared, either by taxpayers, or by stakeholders benefiting from the conserved water. Expecting agricultural producers to foot the full bill for these changes, given today's policy framework, is not reasonable. Large-scale conversion to native grass can be expected to provide economic benefits to local communities. Native grass's resiliency in the face of drought and projected climate change will similarly reduce risk for agricultural producers and the local economies that rely on their production.

Other Information: Provide other information as appropriate, including potential secondary benefits or considerations. Attach supporting documentation or references, if applicable.