REQUEST FOR PROPOSALS

Jordan River Cooperative Weed Management Area Grant Program

Utah Division of Forestry, Fire & State Lands
Jordan River Commission

Overview

The Jordan River Cooperative Weed Management Area Grant Program is a program of Utah Division of Forestry, Fire and State Lands (FFSL) and the Jordan River Commission. Up to $100,000 of grant funding is available per fiscal year for vegetation improvement projects such as invasive species control and native plant restoration on or adjacent to sovereign lands within the Jordan River Corridor. We are accepting proposals for projects that will be completed within the next one to three fiscal years (Fiscal Years 2025, 2026, 2027; see information about fiscal years on page two).

Project examples

Below are a few examples of project work that could be proposed.

- Up to three years of Phragmites control and revegetation treatments (e.g., herbicide application in the late summer before Phragmites is drought stressed, fall seeding or planting, Phragmites mowing in the winter)
- Russian olive and tamarisk removal and revegetation — cut-stump treatments, seeding, and planting for one to three years
- Spring or fall tree and shrub planting for one to three years
- Other weed control using integrated management strategies

Application instructions

1. Applicants are required to meet with Rae Robinson, Jordan River Vegetation Project Coordinator, to discuss project details prior to submitting a proposal. Please email raerobinson@utah.gov no later than March 1, 2024 to set up a time to meet prior to the application deadline.

2. To apply for funding, please **email a project proposal in one pdf document to raerobinson@utah.gov by the application deadline, April 1, 2024**. All proposals should address, at a minimum, the following:

a) A cover sheet *(please use the coversheet template in Appendix 1)*

b) Purpose and need for the project

c) Location map and description of the identified project site

d) Project plans and details, including a description of selected methods or techniques *(refer to best management practices in Appendix 2 to guide methods where applicable)*

e) Estimated project timeline with identified milestones for implementation, including estimated project completion date

f) An itemized summary of estimated project costs that includes, at a minimum:

- Itemized cost estimates for labor, materials, equipment, administration, or other costs

- Amount of funding requested from FFSL *(for projects that span multiple years, the budget must make it clear the amount requested from FFSL for each fiscal year, for up to three fiscal years)*
- Amount and sources of matching funds or in-kind contributions *(match contributions are recommended, but not required)*
- Total project costs

Additional information for applicants

Information about fiscal years

- ***Fiscal year 2025****: July 1, 2024 – June 30, 2025*
- ***Fiscal year 2026****: July 1, 2025 – June 30, 2026*
- ***Fiscal year 2027****: July 1, 2026 – June 30, 2027*

Project funds that are awarded but not spent in one fiscal year will not carry over to the next fiscal year.

Application review and awards

Proposals will be reviewed and awarded by a committee of representatives from FFSL and partner agencies. Successful applicants will be notified by FFSL staff by email or phone by May 3, 2024. Awardees can anticipate working with FFSL to set up a funding agreement in May 2024. Project work that will be reimbursed by FFSL must begin after the date of the final signature on the agreement and no sooner than July 1, 2024.

Information about grant funding

FFSL anticipates awarding up to $100,000 per fiscal year for vegetation improvement projects. FFSL reserves the right to terminate funding agreements if FFSL's ability to fund these projects changes. Project funds that are awarded but not spent in one fiscal year will not carry over to the next fiscal year. FFSL reserves the right to terminate agreements if the awardee fails to meet agreed-upon project deadlines.

State of Utah purchasing rules

Awardees that are awarded over $10,000 may be required to submit proof of a bidding process per state purchasing requirements. Please contact FFSL with any questions regarding this requirement.

Responsibilities of awardees

- Upon notification of grant award, work with FFSL to set up a funding agreement
- Submit three progress reports/year for each fiscal year (one to two pages each; before and after photos required)
- Submit invoices by the end of each fiscal year
- Schedule site visits with FFSL each fiscal year to show project work

Appendix 1: Proposal coversheet template

Applicants must include the information below in the coversheet of their proposal.

Project title:

Applicant organization/agency:

Proposal submission date:

Primary organization/agency point of contact for the application:

- **Name:**
- **Title:**
- **Address:**
- **Email:**
- **Phone:**

Secondary organization/agency point of contact for the application:

- **Name:**
- **Title:**
- **Address:**
- **Email:**
- **Phone:**

Amount of funding requested from FFSL in this proposal:

- **In FY 2025:**
- **In FY 2026:**
- **In FY 2027:**
- **Total:**

Appendix 2: Best management practices for invasive species control and revegetation within the Jordan River Corridor, UT.

The best management practices documents that follow are:

1. Best practices to control non-native, invasive Phragmites within the Jordan River Corridor (Utah, USA)

2. Best practices to control non-native, invasive Russian olive and tamarisk within the Jordan River Corridor (Utah, USA)

3. Best practices for revegetation along the Jordan River (Utah, USA) following control of invasive plant species

If your proposed project includes Phragmites control, Russian olive control, tamarisk control, or revegetation, it is highly advised to use these documents to guide your proposed treatment methods.

Best practices to control non-native, invasive Phragmites within the Jordan River Corridor (Utah, USA)

Rae Robinson, Keith Hambrecht, and Eric McCulley

Version 2 | January 2024

This document was informed by the experience of practitioners working in wetland and riparian areas in the region, including those working with the Jordan River Commission and Division of Forestry, Fire and State Lands.

Introduction

Controlling Phragmites (*Phragmites australis* subsp. *australis*) is a common goal of many land managers working in wetland and riparian areas in North America. In this document we summarize best practices for controlling Phragmites from our experience and those of practitioners working on the Jordan River in UT. We plan to update this document as we make progress treating Phragmites on public and private lands along the Jordan River so that it will be a relevant resource for those working to control Phragmites on the Jordan River.

Non-native, invasive *Phragmites australis* subsp. *australis*

The Phragmites species we reference in this document is the non-native, invasive subspecies that is not originally from North America, has aggressive characteristics, and is on the State of Utah Noxious Weed List. Almost all of the Phragmites in northern Utah is *Phragmites australis* subsp. *australis*. This subspecies outcompetes and replaces diverse native plant communities which sustain diverse resident and migratory wildlife species. Phragmites encroaches into the river channel and up the banks of the Jordan River, impeding human and wildlife access along and to the river. The native subspecies, *Phragmites australis* subsp. *americanus*, does not grow as densely and may have subtle morphological differences (e.g., leaf sheath falls off easily in the native subspecies; it stays tightly attached to the dead culm in the non-native subspecies).

How to prioritize sites

The criteria below may be useful in identifying areas to prioritize Phragmites control and restoration.
These criteria were developed by the Phragmites Working Group for the Jordan River.

Critical need — areas where ecosystem functions and services are at great risk and demand immediate attention

Protection — areas where ecosystem functions and services are of high quality but need management to maintain this status

Leveraged efforts — areas where control efforts would build upon other investments along the Jordan River

How to control Phragmites

- We recommend integrating mechanical (i.e., mowing), chemical (i.e., herbicide), and revegetation strategies to control Phragmites on the Jordan River. Research shows that the application of these three strategies is much more effective than one of these techniques alone.
- Typically, Phragmites will need to be controlled with mechanical and chemical treatments within the same year, for 3–5 years. Revegetation will likely be needed to assist in the recovery of native plants.
- Other strategies to control Phragmites, such as grazing and water control, may apply in some places on the Jordan River, however due the nature of the Jordan River system (e.g., highly developed, regulated flows), these strategies may be less applicable.

Treatment timeline for Phragmites control

June – July	July – September	October – April
Mowing [a]	Herbicide [b]	Mowing [c]
		Revegetation [d]

The above table shows a coarse timeline for controlling Phragmites. ***This timeline should be repeated each year until Phragmites is controlled (typically this will take 3–5 years).*** *The timing of these treatments may vary due to the weather from year to year and the location of the restoration site.*

a: Mowing in June or July can improve access for spraying and reduce seed production. This step is optional. Take precautions to avoid disrupting nesting birds.

b: Appropriate timing for spraying may vary within a given site. Drier areas may need to be sprayed in July before plants are drought-stressed (see note below about drought stress). Phragmites growing in wet areas likely can be sprayed in August and September. Spraying later in the season has been shown to yield better long term control.

c: This mowing treatment will break up the standing dead Phragmites and will allow light to reach the soil surface (important for germination of native plants).

d: Revegetation (e.g., sowing seeds, planting trees) adjacent to small patches of Phragmites can be pursued in the first year of control. Revegetation within dense Phragmites stands should be pursued only when significant progress has been made in reducing Phragmites cover and biomass. Care should be taken to avoid spraying or mowing newly revegetated areas. Generally, the best time to revegetate is in the fall or spring when conditions are cool and moist.

Important considerations for the timing of treatments

- **Spray Phragmites with herbicide before it becomes drought-stressed.** When the plant is stressed it has a weakened ability to metabolize the herbicide. Drought stress can present as obvious or subtle yellowing of the leaves. Context clues, like the current drought status, or distance to water can help determine if the plant is drought-stressed. Be aware that there may be a shorter window to spray Phragmites that is growing further from water.
- **Do not mow Phragmites within one month of an herbicide treatment, before or after.**
- **Be sure to spray Phragmites before the first frost.**

Yellowing at the tips of Phragmites leaves can indicate drought stress.

Recommended herbicide mixture

You must follow all labels of the products applied and calibrate your spray equipment.

- Aquatic-approved glyphosate; use the high end of the labeled rate (e.g., RoundUp Custom at 3 Qt/acre, or 1.5% solution for handheld spot spray)
- Aquatic-approved, non-ionic surfactant (e.g., LI-700 at labeled rate)
- Ammonium sulfate (8 to 17 lbs per 100 gallon spray solution)
- Clean water
- Dye (at the labeled rate)

Aquatic-approved imazapyr herbicides are also an option, but they are more expensive, persist in the soil (potentially affecting desirable seedlings), and have more label restrictions. Consider using imazapyr, if the label allows, in areas where glyphosate has been used for many years to prevent herbicide resistance from developing.

Other considerations

- Create work corridors to allow vehicles and people to efficiently access the restoration site. This may involve removing some Russian olive, tamarisk, and Phragmites.
- Consider bank erosion— in some places it may not be appropriate to remove Phragmites if its removal will accelerate erosion that will negatively affect infrastructure.
- To prevent clonal expansion of small Phragmites stands, consider hand pulling Phragmites runners.

Phragmites treatment methods, equipment, and materials

Mowing — to reduce seed production, improve access, and remove dead biomass	
Equipment	**Useful when…**
Brushcutter (e.g., Stihl FS 561 C-EM with tri-bladed brush knife attachment)	Small area; poor vehicle access
Marsh Master or other wetland tractor with mower	Large area; mostly flat, wet ground
Skid steer with mowing attachment	Patches of all sizes; dry ground
Mini excavator with mowing attachment	Steep slopes

Herbicide spraying — to kill the plant	
Equipment	**Useful when…**
Backpack sprayer	Small area; short or sparse Phragmites; poor vehicle access
Argo (amphibious side-by-side)	Wet ground (but avoid deep standing water); tall Phragmites
UTV (side-by-side)	Dry ground
Drone	High vantage point nearby; poor access by foot and vehicle
Marsh Master or other wetland tractor	Large area; mostly flat, wet ground
Boat (e.g., Jon boat)	Poor access from land

Revegetation — to assist in the recovery of native plant species and prevent Phragmites reinvasion
Plant materials
Seed
Potted trees, shrubs, grasses, forbs
Cuttings
Sod mats
For more information about revegetation see "Best practices for revegetation along the Jordan River (Utah, USA) following control of invasive plant species".

For more information about the Jordan River Cooperative Weed Management Area please contact Rae Robinson, Jordan River Vegetation Project Coordinator, at raerobinson@utah.gov.

Best practices to control non-native, invasive Russian olive and tamarisk within the Jordan River Corridor (Utah, USA)

Rae Robinson, Keith Hambrecht, and Eric McCulley

Version 2 | January 2024

This document was informed by the experience of practitioners working in wetland and riparian areas in the region, including those working with the Jordan River Commission and Division of Forestry, Fire and State Lands.

Introduction

Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix* species) are non-native, invasive tree species that are common in the Jordan River system and are on the State of Utah Noxious Weed List. These species outcompete native plant species, reduce the complexity of the ecosystem, and make it difficult for wildlife and humans to access the river. A common goal for land managers along the Jordan River is to control these two species and support the recovery of a diverse riparian plant community (native trees, shrubs, grasses, and forbs). We summarize best practices for controlling these species from our experience and those of practitioners working on the Jordan River in UT.

Important considerations for Russian olive and tamarisk control

In general, plan to remove invasive trees and revegetate with native plants in phases. This will help to mitigate the dramatic and quick loss of structure, habitat, and shade.

Bird habitat

- If there are known high use areas by birds, especially sensitive species, map and monitor these locations. Avoid removals in these areas or wait until nearby higher quality habitat is established and see if birds shift over to these new spots.
- When possible, use a frill cut treatment on large diameter, tall, and straight Russian olive trees to provide perches.
- Typically, it is fine to remove lone Russian olive and tamarisk trees, as they do not provide frequently utilized habitat.

Shade

- In some situations, it may be appropriate to revegetate the project site with native plants prior to removing all of the tall shade-providing invasive trees. Once tall native vegetation is established, the rest of the invasive trees can be removed.

Erosion

- Invasive trees growing on and near the river's edge assist in stabilizing the bank. Removing these trees may lead to bank erosion over time. Consider these effects before removing invasive trees along the river's edge.

Revegetation

Many restoration sites will need active revegetation to restore ecosystem functions and fulfill restoration goals. For more information, see "Best practices for revegetation along the Jordan River (Utah, USA) following control of invasive plant species".

Selection of techniques

There are several different ways to control Russian olive and tamarisk. We highlight the most effective strategies below. The cut stump method will kill the tree and allow for the biomass to be chipped or piled. The frill cut method will kill the tree slowly and will result in standing dead branches that may create desirable bird habitat. For small project areas, hand-pulling first-year seedlings works well for preventing infestations. These control treatments can occur any time of year except for when the ground is frozen.

Cut stump for Russian olive and tamarisk

- For tall trees, cut the stumps a few feet tall and clear the biomass away from the tree. Once the biomass is cleared from the area, cut stumps low and **immediately** apply herbicide to the cambium layer, the layer of living cells underneath the bark of the tree. No need to apply herbicide to the bark or inner core wood.
- Before applying herbicide, be sure to wipe away any dirt or sawdust from the stump that would inhibit herbicide uptake.
- **Any untreated stumps or whips will vigorously regrow**.
- Consider cutting stumps to ~4" above the ground to allow for retreatment if regrowth occurs.
- Chip or pile the biomass. Piles should be densely packed and be no bigger than 6 x 6 ft. Piles can be burned or left to provide habitat for insects, birds, and small mammals. Do not pile in areas that could flood—intact branches have the potential to take root.
- While chainsaws or a skid steer with a mastication head attachment can be used for large trees, heavy duty loppers work well for smaller stems.

Cut stump herbicide application set up

Frill cut for Russian olive

- With a hatchet or ax, chop through the bark into the tree at a downward angle so the frill cut will hold the chemical.
- **Immediately** inject or pour 1ml of herbicide into each frill cut.
- Space frill cuts around the stem(s) of the tree, one frill for every 2–3 inches of the tree diameter at breast height. Leave space in between the cuts—the tree must be able to move the chemical via intact phloem.
- Multiple stems should be treated separately.
- Leave the tree in place for at least a year to be sure the tree has been killed.

A frill cut

Recommended herbicide mixtures

You must follow all labels of the products applied.

- Russian olive – for cut stump and frill cut, undiluted glyphosate
- Tamarisk – for cut stump, undiluted triclopyr or imazapyr at labeled rate
- Penetrant/surfactant for cut stump treatments (e.g., LI-700 at ~2 oz per gallon)
- Dye (at the labeled rate)

Use caution when applying herbicide near native vegetation. Imazapyr herbicides persist in the soil (potentially affecting desirable seedlings) and have more label restrictions.

For more information about the Jordan River Cooperative Weed Management Area please contact Rae Robinson, Jordan River Vegetation Project Coordinator, at raerobinson@utah.gov.

Best practices for revegetation along the Jordan River (Utah, USA) following control of invasive plant species

Rae Robinson, Keith Hambrecht, and Eric McCulley

Version 2 | January 2024

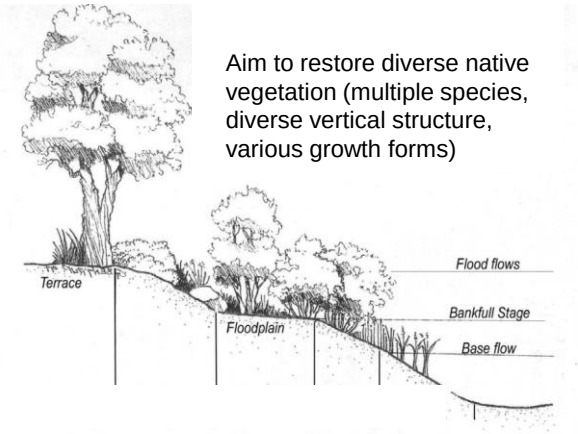
This document was informed by the experience of practitioners working in wetland and riparian areas in the region, including those working with the Jordan River Commission and Division of Forestry, Fire and State Lands.

Introduction

A common goal for land managers along the Jordan River is to control Phragmites (*Phragmites australis* subsp. *australis*), Russian olive (*Elaeagnus angustifolia*), tamarisk (*Tamarix* species), and puncturevine (*Tribulus terrestris*) and restore diverse plant communities (with numerous native tree, shrub, grass, and forb species). We summarize best practices for revegetation from our experience and those of practitioners working on the Jordan River in UT.

Why pursue active revegetation

Removing large populations of invasive species may result in the loss of important ecosystem functions (e.g., temperature regulation/shade, nutrient cycling, bank stabilization, habitat). Ideally this loss is temporary and diverse native plants replace (and improve) these ecosystem functions. But often native plants fail to quickly recover, especially if environmental conditions are not favorable, secondary invasions threaten the restoration site, or surrounding native plant populations (in the seedbank and adjacent areas) are insufficient. **Active revegetation can accelerate native species establishment and prevent reinvasion of invasive species.**



Source: Hoag, et al., 2001. Riparian Planting Zones in the Intermountain West. Information Series #16. NRCS - Plant Material Center, Aberdeen, ID.

When to revegetate

Revegetation can be implemented at a restoration site before, during, or after invasive plant control, depending on the site. The timing of revegetation will depend on restoration goals, the extent of the invasion, and how well the species has been controlled. Multiple years of revegetation may be necessary to achieve the desired cover or density of species.

Revegetation prior to invasive species control

Example: Planting trees earlier in the restoration process gives planted trees a "head start". Caution— be sure not to plant or seed in areas that will be in the way of future invasive species control treatments.

Revegetation during invasive species control

Example: If removing Russian olive and tamarisk trees patch by patch at a site, consider revegetating newly barren patches using a phased approach.

Revegetation after effective invasive species control

Example: When revegetating an area that was previously occupied by a dense Phragmites stand, be sure Phragmites cover and biomass is minimal (after many years of treatment) before proceeding with revegetation.

Revegetation after a disturbance of earth (e.g., utilities, trails, boat ramps)

Revegetate within two weeks of the disturbance, no matter the time of year. Follow up with additional revegetation treatments in the fall and spring.

Important considerations

- The quick recovery of native plant cover to an area will provide resistance to future reinvasion.
- Mark and protect revegetation areas. Do not let herbicide drift damage native plant communities. Be sure to protect revegetation areas from herbivory (e.g., use at least 14-gauge welded wire fencing around trees).
- Invasive plant seeds are transported on shoes and equipment. Be sure to properly clean equipment before moving to a new site.

Revegetation methods

Moisture is key to successful revegetation, especially in the first few years following planting or seeding. Knowledge of water availability at your site (e.g., depth to ground water, timing and duration of inundation) will be valuable to your restoration planning. Supplemental irrigation or selection of drought-tolerant species may be required for drier sites. Generally, revegetation should take place in the fall or spring to capitalize on favorable conditions. Below are short descriptions of revegetation methods that may be useful along the Jordan River.

Plant materials	Brief methods and equipment	Notes
 Seed	• Sow a species-diverse seed mix (the species in the mix will depend on your restoration goals) • Use a handheld seed spreader and rake, Argo or UTV with hopper and harrow, or hydroseeder	• Harrow or rake seeds into soil to ensure good seed to soil contact. • Many species exhibit dormancy. Fall seedings will allow for greater seed dormancy break. If seeding in the spring, consider a cold stratification treatment. • Reach out to the Jordan River Commission for seed mix examples and guidance.
 Potted plants (i.e., plugs, containerized plants of all sizes)	• Use shovels or machine-powered augers for digging holes • Water the hole prior to planting • When planting the tree, create a shallow depression around the tree at the soil surface • Water the tree immediately after planting	• Deep-rooted plants (e.g., 30” tall potted plants) may do better than plants with shallower roots when ground water is less available. • Knowledge of site hydrology is key. Supplemental irrigation may be needed in the first two to three years.
 Cuttings/pole plantings	• Some wetland plants (e.g., willows, cottonwoods) can be propagated from cuttings. • See “A Guide for Harvesting, Storing and Planting Dormant Willow Cuttings” (Wildlands Restoration Volunteers, 2008) for more information.	• Soak cuttings in water for 2-10 days prior to a dormant planting. • Rebar, an auger, or a water stinger can be used to create deep holes (a majority of the cutting will be buried).
 Sod mats	• Use stakes to secure mats to the ground • If hydrology is insufficient to keep roots wet, supplemental irrigation may be needed following installation	• Sod mats may be useful in areas with consistent hydrology and a 3:1 slope or less. • Native plant nurseries usually need a long lead time to grow sod mats for projects.

Plant material source — It is best practice to source local plant materials (e.g., from within the watershed, state, region) whenever possible. However, sourcing materials from further away (but still within the West) is acceptable for species that have a high degree of plasticity (e.g., many bulrushes, rushes, sedges) or those that are not available otherwise.

Species to consider for revegetation

Functional group	Common name	Scientific name	Wetland indicator status*
Riparian trees	Box elder	*Acer negundo*	FACW
	Black hawthorn	*Crataegus douglasii*	FAC
	Fremont cottonwood	*Populus fremontii*	FACW
	Peachleaf willow	*Salix amygdaloides*	FACW
	Whiplash willow	*Salix lasiandra*	FACW
Shrubs	Big sagebrush	*Artemisia tridentata*	FACU
	Fourwing saltbush	*Atriplex canescens*	UPL
	Rubber rabbitbrush	*Ericameria nauseosa*	UPL
	Broom snakeweed	*Gutierrezia sarothrae*	NI
	Chokecherry	*Prunus virginiana*	FAC
	Skunkbush sumac	*Rhus trilobata*	FACU
	Golden currant	*Ribes aureum*	FAC
	Woods' rose	*Rosa woodsii*	FACU
	Sandbar/coyote willow	*Salix exigua*	FACW
	Greasewood	*Sarcobatus vermiculatus*	FAC
	Silver buffaloberry	*Shepherdia argentea*	FACU
Forbs (flowering herbaceous species)	Common yarrow	*Achillea millefolium*	NI
	White sagebrush	*Artemisia ludoviciana*	FACU
	Swamp milkweed	*Asclepias incarnata*	OBL
	Showy milkweed	*Asclepias speciosa*	FAC
	Hairy false goldenaster	*Chrysopsis villosa*	NI
	Rocky Mountain beeplant	*Cleome serrulata*	FACU
	Blanket flower species	*Gaillardia spp.*	FACU
	Curly cup gumweed	*Grindelia squarrosa*	FACU
	Annual sunflower	*Helianthus annuus*	FACU
	Nuttall's sunflower	*Helianthus nuttallii*	FACW
	Lewis flax	*Linum lewisii*	NI
	Canada goldenrod	*Solidago canadensis*	FACU
Graminoids (grasses and grass-like species)	Saltgrass	*Distichlis spicata*	FAC
	Nebraska sedge	*Carex nebrascensis*	OBL
	Common spikerush	*Eleocharis palustris*	OBL
	Common field sedge	*Carex praegracilis*	FACW
	Arctic rush	*Juncus arcticus*	FACW
	Torrey's rush	*Juncus torreyi*	FACW
	Western wheatgrass	*Pascopyrum smithii*	FAC
	Sandberg bluegrass	*Poa secunda*	FACU
	Nuttall's alkaligrass	*Puccinellia nuttalliana*	FACW
	Hardstem bulrush	*Schoenoplectus acutus*	OBL
	Chairmaker's bulrush	*Schoenoplectus americanus*	OBL
	Common threesquare bulrush	*Schoenoplectus pungens*	OBL
	Alkali sacaton	*Sporobolus airoides*	FAC
	Sand dropseed	*Sporobolus cryptandrus*	FACU

*** Wetland indicator status abbreviations**

UPL = upland (almost never occur in wetlands)
FACU = facultative upland (usually occur in non-wetlands, but may occur in wetlands)
FAC = facultative (occur in wetlands and non-wetlands)
FACW = facultative wetland (usually occur in wetlands, but may occur in non-wetlands)
OBL = obligate (almost always occur in wetlands)
NI = non-indicator

Note: Some of the species in this table may not be commercially available. Local collection of seed or cuttings may be possible by some nurseries, seed collectors, students, or volunteers.

For more information about the Jordan River Cooperative Weed Management Area please contact Rae Robinson, Jordan River Vegetation Project Coordinator, at raerobinson@utah.gov.