

**ARIZONA GAME AND FISH DEPARTMENT  
HABITAT PARTNERSHIP PROGRAM  
HABITAT ENHANCEMENT AND WILDLIFE MANAGEMENT PROPOSAL**

**PROJECT INFORMATION**

<b>Project Title:</b> San Pedro Riparian National Conservation Area Tamarisk Control		<b>Project No.</b> 11-502
<b>Region/GMU:</b> Region 5/GMUs 30B, 34B, 35A		<b>HPC:</b> Sierra Vista / Douglas
<b>Project Type:</b> Tree Shearing (see attached tree shearing worksheet)		
<p><b>Project Description:</b> Located between the Huachuca and Mule Mountains of southeastern Arizona, and adjacent to Mexico, the San Pedro Riparian National Conservation Area (SPRNCA) is uniquely located for attracting a diversity of species from a wide variety of vegetative life-zones. This landscape phase project is located on the SPRNCA and will serve to provide native wildlife habitat for those species present on the SPRNCA that are adapted to this native habitat (e.g. migratory birds such as yellow-billed cuckoo, non-migratory birds such as quail and Gould's turkey, game animals such as mule deer and white-tailed deer). The project is proposed to continue at those areas on SPRNCA where there is little tamarisk invasion, and scheduled to work from the south to the north boundary where tamarisk becomes more dense. <b>The San Pedro River riparian cottonwood/willow gallery will receive tamarisk control in the form of cut-stump treatment to larger tamarisk, and foliar application to very small tamarisk. In addition, tamarisk control will occur in isolated springs and seeps (Horsethief, Lewis), as well as at the St. David Cienega (one of two remaining cienegas within the SPRNCA).</b> Benefits to deer, javelina, and turkey include a more open habitat composed of native plant species that provide more appropriate density, cover, and food sources.</p>		
<b>Wildlife Species to Benefit:</b> Mule deer, white-tailed deer, javelina, Gould's turkey		
<b>Possible Funding Partners:</b> Arizona Assoc. of Conservation Districts, BLM		
<b>Implementation Schedule:</b> <b>Beginning:</b> 2009 <b>Completed:</b> 2013		<b>NEPA Compliance: (if applicable)</b> <b>Completed:</b> Yes <input checked="" type="checkbox"/> (2009) No <input type="checkbox"/> USFWS consultation completed <b>Projected Completion Date:</b>

**PROJECT FUNDING**

<b>SBG Funds Requested:</b> \$10,000.00
<b>Cost Share Funds:</b> \$25,000.00 from AACD agreement plus \$15,000 per year labor/materials from BLM
<b>Total Project Costs:</b> \$50,000.00

**PARTICIPANT INFORMATION**

<b>Applicant:</b> Bureau of Land Management (please print) Marcia Radke <b>Telephone:</b> 520 439-6428		<b>Address:</b> 1763 Paseo San Luis Sierra Vista, AZ 85635	
<b>AGFD Contact and Phone No.</b> Marcia Radke 520 439-6428 <b>(If applicant is not AGFD personnel)</b>			
<b>Coordinated with:</b> Brad Fulk (Wildlife Manager - AGFD), Jon McClard (Wildlife Manager - AGFD), SEAZ-HPC (07/12/11), Emilio Carillo (USDA-NRCS), Rachel Thomas (vice-chairman Hereford NRCD), Stephanie Smallhouse (Executive Officer - AZ Assoc. Conservation Districts), Deb Smith (AZ Assoc. Conservation Districts)			<b>Date:</b> 07/12/11 (HPC meeting) and 08/10/11 (meeting with AACD, NRCS, NRCD)
<b>Applicant's signature:</b>			<b>Date:</b>

**SEND COMPLETED APPLICATIONS TO:  
AZ Game and Fish Department  
Attn: Game Branch**

**5000 W. Carefree Highway  
Phoenix, AZ 85086**

[@azgfd.](#)

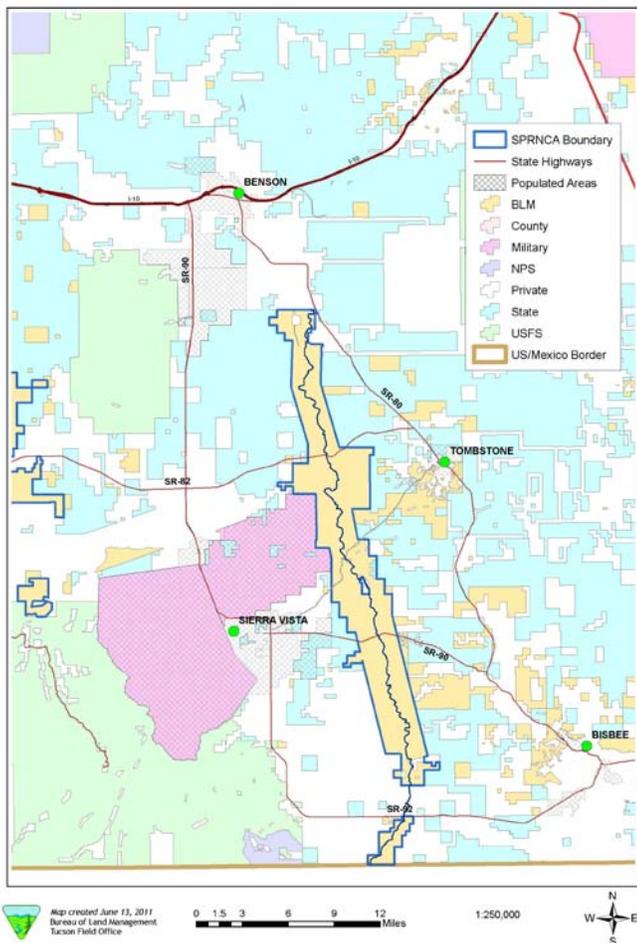
**WAS PROJECT PRESENTED TO THE LOCAL HPC? YES X (07/12/11) NO \_\_\_\_\_**  
**HAS PROJECT BEEN SUBMITTED IN PREVIOUS YEARS? IF SO WAS IT FUNDED?**

No, the project has not been submitted previously.

**NEED STATEMENT/PROBLEM ANALYSIS:**

**History of SPRNCA and ownership:** The San Pedro Riparian National Conservation Area (SPRNCA) was established by Public Law 100-696 during 1988 “in order to protect the riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River...” SPRNCA is managed by the U.S. Bureau of Land Management (BLM) as part of the National Landscape Conservation System and, as such, serves as an open, undeveloped area as a showcase for BLM’s conservation side of its multiple-use mandate. SPRNCA contains approximately 57,000 acres along more than 40 river miles, ranging from approximately 3600’ in elevation south of I-10 at Saint David to 4300’ in elevation at the International Boundary (Figure 1). The free-flowing hydrology (i.e. undammed) and permanent water reaches of the San Pedro River are notable among other southwestern rivers. Numerous tributaries are ephemeral and surface flow in these washes is only in response to rainfall events. Influence from the Sierra Madre, Rocky Mountains, Sonoran, and Chihuahuan Deserts create a landscape of species richness in plants and animals.

Figure 1. SPRNCA Vicinity Map



**Sportsmens’ access/hunting opportunities:** The SPRNCA has twelve established parking areas/trailheads; Land Corral, Terrenate, Fairbank, Boquillas, Millville, Charleston, Escapule, Murray Springs, San Pedro House, Hereford,

(revised 7-02-2007)

Lehner, and Palominas. Target shooting is prohibited, as well as discharge of firearms within ¼ mile of developed facilities. The area between Charleston Road and Hwy 92 is closed to the possession or discharge of firearms for the purpose of wildlife protection and public safety. However, subject to all rules and regulations of the Arizona Game and Fish Department, firearm discharge for the purpose of authorized and regulated hunting is permitted south of Land Corral to Charleston (including the Land Corral, Terrenate, Fairbank, Boquillas, Millville, and Charleston parking areas/trailheads), and south of Hwy 92 to the International Boundary (including the Palominas parking area/trailhead) from Sept. 1 through March 31. In addition, archery hunting and fishing is permitted throughout the SPRNCA, subject to all rules and regulations of the Arizona Game and Fish Department, and includes the additional Escapule, Murray Springs, San Pedro House, Hereford, and Lehner parking areas/trailheads. Trapping is prohibited at all times in the NCA. Species available for harvest include white-tailed deer, mule deer, javelina, mourning and white-winged dove, Gambel's and scaled quail, cottontail and jackrabbit, and sport fish (large-mouthed bass, channel catfish, and black bullhead).

**Management concerns/issues:** A threat to the conservation and preservation of the cottonwood gallery forest is the introduction of non-native invasive plant species that have tendencies to outcompete and replace native vegetation, thereby resulting in eventual degradation or loss of native plants and even monocultures of the introduced plant species. Invasive plant species found on the San Pedro Riparian NCA, and known to form large monocultures, include introduced tamarisk (*Tamarix spp.*), giant reed (*Arundo donax*), and Russian olive (*Elaeagnus angustifolia*). Seasonal water stress due to depression of floodplain water tables, elimination of annual floods, heavy invasive species' fuel loads, superior adaptation to fire of invasive species, and increasing population densities of invasive plant species is likely to result in a community shift toward more stress-tolerant taxa such as tamarisk, giant reed, and Russian olive. This conversion from cottonwood-willow forest to monocultures of introduced plant species is expected to result in a lack of appropriate wildlife habitat for game and non-game species alike. All giant reed and Russian olive within the SPRNCA boundary has been eradicated by BLM during 2009-2010, although some giant reed does occur within private inholdings or ROW within the NCA boundary. Tamarisk control has continued during 2011 at Murray and Contention Springs, and fall 2011 control will focus on the remainder of the Waters Road to Hereford section, and the Hereford to Hwy 90 section. Future treatments will continue north, as funding allows, and emphasis may also occur at the St. David Cienega.

Although the SPRNCA contains significant aquatic resources, long-term drought, groundwater depletion, and climate change have the potential of drying many of the previously permanent water sources along the San Pedro River, some of which are now intermittent reaches. Only approximately 15 of the 50 miles within the SPRNCA now have permanent water (approximately Waters Road boundary to just north of Charleston). In addition, the U.S./Mexico border fence has created difficulty for some wildlife species to travel traditional routes for water and/or food. Formal consultation with US Fish and Wildlife Service has occurred, as well as completion of an Environmental Assessment in 2009. Nesting southwestern willow flycatcher were last documented on SPRNCA in the Hereford area during 2005, and tamarisk control is conducted outside of nesting season, therefore, adverse effects to southwestern willow flycatcher and other nesting birds is considered to be unlikely. Tamarisk control will likely be of benefit to cottonwood gallery-obligates, such as the candidate species yellow-billed cuckoo.

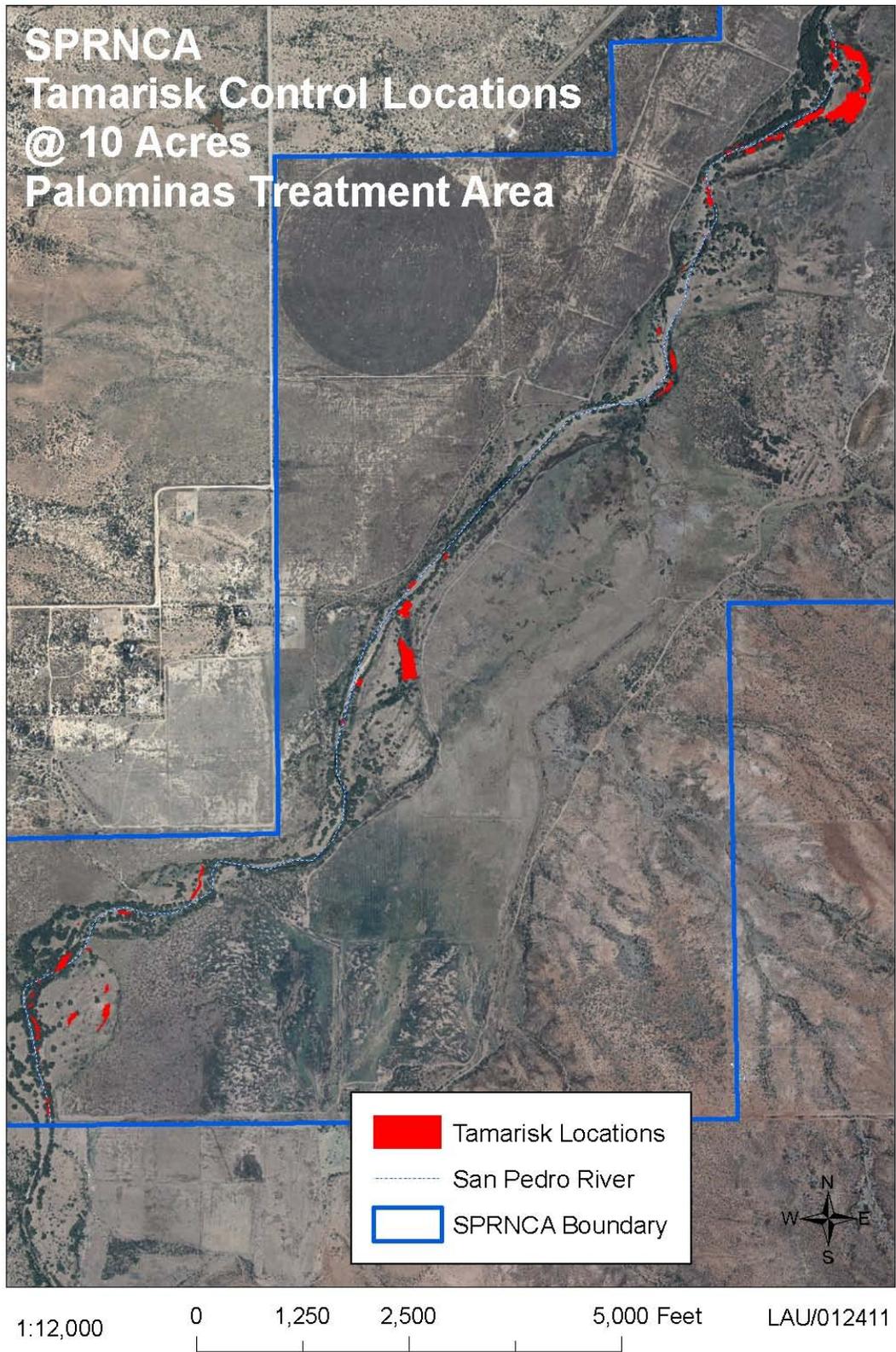
#### **PROJECT OBJECTIVES:**

The objectives of the project are to control tamarisk within the reach of the San Pedro River between the International Boundary and Fairbank, including isolated springs (e.g. Horsethief, Lewis, Murray, Contention) and the St. David Cienega. Additional tamarisk control would occur north of Fairbank to Land Corral as funding allows.

#### **PROJECT STRATEGIES:**

The environmental assessment was completed with the strategy of controlling tamarisk in those areas where tamarisk is not widely established, where less funding, staffing, and herbicide use would be required. This design planned for initial tamarisk control to begin at the International Boundary and to work progressively north to Land Corral, where tamarisk infestation becomes much more severe. In addition, those areas with little tamarisk invasion are able to passively revegetate, i.e. native vegetation is present in enough quantity and species richness in order to revegetate naturally without the need of additional plantings or seeding. Tamarisk control during 2009-2010 is shown in Figure 2, and control will continue north, at springs and seeps, and at the St. David Cienega, as funding allows.

Figure 2. SPRNCA Tamarisk Control 2009-2010.



**PROJECT LOCATION:**

San Pedro Riparian National Conservation Area, Cochise County

**LAND OWNERSHIP AT PROJECT SITE (Please state specifically if PRIVATE PROPERTY and provide landowner's name):**

USDI – Bureau of Land Management, National Landscape Conservation System, San Pedro Riparian National Conservation Area

**IF PRIVATE PROPERTY, IS THERE A STEWARDSHIP AGREEMENT BETWEEN THE LANDOWNER AND THE DEPARTMENT?**

Not applicable.

**HABITAT DESCRIPTION:**

The “river of green” is the cottonwood (*Populus fremontii*)/Goodding’s willow (*Salix gooddingii*) gallery forest, which occurs along the entire length of the SPRNCA, but is invaded in increasing numbers by tamarisk (*Tamarisk ramosissima*) from roughly Fairbank north to Land Corral. Mesquite bosque occurs in transition from cottonwood gallery forest to terrace vegetation, and these terraces may include netleaf hackberry (*Celtis reticulata*), graythorn (*Ziziphus obtusifolia*), littleleaf sumac (*Rhus microphylla*), four-wing saltbush (*Atriplex canescens*), and golden eye (*Viguiera dentata*). Chihuahuan Desertscrub vegetation covers the largest area within the SPRNCA, and is characterized by long-lived shrubs such as creosote (*Larrea tridentata*), acacia (*Acacia spp.*), tarbush (*Flourensia cernua*), and mesquite (*Prosopis velutina*). Sacaton (*Sporobolus wrightii*) grasslands cover large areas of the terraces in areas not previously cleared for agriculture, but is voluntarily returning in many fields where it has not already been seeded. Mesquite and sacaton uplands occur in many locations throughout SPRNCA. Average elevation is approximately 3900’, and soils are generally Brookline-Fluvaquents-Riverwash complex, 0 to 3 percent slopes.

**ITEMIZED USE OF FUNDS:**

Through an assistance agreement between BLM and Arizona Association of Conservation Districts (AACD), \$25,000 is available for weed control within the San Pedro River watershed inside the Hereford Natural Resource Conservation District boundary. Total cost to BLM for past tamarisk control from 2009-2010 is estimated at \$29,080 (see attached woody invasives removal cost tracking form). Future matching cost-share will be provided by BLM in the form of labor for the Wildlife Biologist (AZDA commercial applicator) or Fuels Specialist (BLM applicator), annual training and certification fees, survey and mapping, monitoring, staff time for supervision, GIS specialist, cost for pesticide and application equipment, etc. This is anticipated to be approximately \$15,000 per year of BLM cost-share (based on estimate for two years on the attached woody invasives removal cost tracking form). The \$25,000 from the AACD, and the \$10,000 from the SBG funds, would be used to provide labor through the Arizona State Forestry Division Wildland Fire Crews for cut-stump treatment of tamarisk, beginning at Waters Road to Hereford Road, Hereford Road to Hwy 90, Hwy 90 to Charleston Road, Charleston Road to Hwy 82, isolated springs and seeps, the St. David Cienega, and from Hwy 82 to Land Corral as funding allows.

**LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:**

Emilio Carillo (USDA-NRCS), Rachel Thomas (vice-chairman Hereford NRCD), Stephanie Smallhouse (Executive Officer – AZ Assoc. Conservation Districts), Deb Smith (AZ Assoc. Conservation Districts).

**PROJECT MONITORING PLAN:**

The BLM Wildlife Biologist will monitor the projects for follow-up weed control and for documentation of wildlife use.

**PROJECT MAINTENANCE:**

The BLM Wildlife Biologist will routinely check areas where tamarisk control has occurred and complete any necessary spraying of resprouts. The Palominas unit has been checked and retreated, as necessary (see attached map of tamarisk control to-date).

**PROJECT COMPLETION REPORT TO BE FILED BY:**

BLM Wildlife Biologist Marcia Radke

**WATER DEVELOPMENT PROJECTS (see attached worksheet):**

**TREE SHEARING (AGRA-AXE, PUSH) PROJECTS (see attached worksheet):**

**ARIZONA GAME AND FISH DEPARTMENT**  
**WATER DEVELOPMENT WORKSHEET**

**PROJECT NAME:** \_\_\_\_\_

- 1) **Is the water development listed as a priority in the most recent “Wildlife Water Development Annual Implementation Schedule?”**
- 2) **Please list the Development Branch personnel and date coordinated with for this project.**
- 3) **What is the estimated annual inches of precipitation for the area? (mark one)**  
\_\_\_2-4 \_\_\_4-6 \_\_\_6-8 \_\_\_8-10 \_\_\_10-12 \_\_\_12-14 \_\_\_14-16 \_\_\_>16
- 4) **Is there a perennial water source available to big game within four miles of this project?**  
\_\_\_YES (please complete #5 below) \_\_\_NO (skip #5 below)
- 5) **For the accessible, perennial water source nearest this project:**  
Name of water source:  
Type of water source (catchment, spring, dirt tank, etc.):  
Ownership of water source:  
Distance in miles from project:
- 6) **Is the target wildlife species a result of transplant efforts?** \_\_\_YES \_\_\_NO
- 7) **Please list any special land management status for the project site (i.e. Wilderness, National Park, National Monument, etc). If private land, list landowner.**
- 8) **Please provide the following information about access to the proposed site:**  
Type of access (mark one): \_\_\_2x4 vehicles \_\_\_4x4 only \_\_\_foot only\*\*  
\*\*If foot access only: Distance in miles: Approx. hiking time:  
  
-- Does access to this site require crossing private or tribal lands? \_\_\_YES \_\_\_NO  
  
-- Please describe any restrictions to public access:
- 9) **Please list below (or on a separate sheet) the material type and dimensions of each component proposed to be added, modified, or repaired.**
- 10) **Was a site visit completed?** \_\_\_ Yes \_\_\_No  
If Yes, please list personnel that attended and date.

## **ARIZONA GAME AND FISH DEPARTMENT**

### **TREE SHEARING WORKSHEET**

**PROJECT NAME:** San Pedro Riparian National Conservation Area Tamarisk Control

Tamarisk control on the San Pedro Riparian National Conservation Area has been occurring since 2009 (see attached map of tamarisk control to-date), and is part of larger wildlife habitat improvement projects. Developed wildlife waters have been maintained, and future waters are planned. Listed species reintroductions have been planned and completed, which include Huachuca water umbel during December 2010 and desert pupfish during August 2011 (with completion of environmental assessment and USFWS consultation), and spring improvements have been completed (White House Well) or are planned for the future (Little Joe Spring). Another project has been the construction of seven burrowing owl artificial burrows in the Palominas unit.

**1) What is the estimated acreage of the project?**

Tamarisk infestation is estimated at a total of 377 acres out of 2,421 acres surveyed. Of the 377 acres, approximately 332 are located north of Fairbank (Area 6 below), and would receive tamarisk control as funding allows. The tamarisk control project on the San Pedro Riparian National Conservation Area was initiated during 2009 and has continued through 2011. An environmental assessment and consultation with USFWS is complete. The project objective includes providing native vegetation for those wildlife species that are adapted to this habitat. Native vegetation consists of Fremont cottonwood, Goodding's willow, seep willow, hackberry, desert willow, soapberry, mesquite, black walnut, littleleaf sumac, greythorn, rabbitbrush, deergrass, giant sacaton, and other native forbs and grasses. Approximately 12 acres of tamarisk have been treated using either the cut-stump method of selective herbicide application, or the foliar application of herbicide on small (<5' tall) tamarisk. Control areas completed to-date include the International Boundary to Hwy 92 (Area 1), portions of Waters Road to Hereford Road (Area 2), portions of Hereford Road to Hwy 90 (Area 3), Murray Spring, and Contention Spring. The number of acres surveyed and/or treated per area is as follows.

- Area 1 (International Boundary to Hwy 92): This area has been treated during 2009-2011 and is currently approximately 99% tamarisk-free. There are about six isolated tamarisk trees that were overlooked during treatment; these will be controlled during a follow-up visit. Area 1 contains 200 acres that were surveyed for tamarisk. Of this acreage, approximately 10 acres (or 5% or the 200 acres surveyed) of tamarisk was treated using the cut-stump or foliar method.
- Area 2 (Waters Road to Hereford Road): Tamarisk control in Area 2 was initiated during 2010 on approximately one acre of the 100 acres surveyed. There is an estimated one acre of tamarisk control remaining in Area 2, for a total of 2% of tamarisk. The completion of this area is scheduled for fall of 2011.
- Area 3 (Hereford Road to Hwy 90): Tamarisk control in Area 3 was initiated during 2010, and included five tamarisk on the east side of the San Pedro River. Tamarisk survey and mapping is complete, and includes approximately three acres of tamarisk in the 410 acres surveyed (less than 1%). The completion of this area is scheduled for fall of 2011.
- Area 4 (Hwy 90 to Charleston Road): Tamarisk survey and control has not been initiated in this area, and will be planned for 2012. Area 4 survey area is 198 acres. There is little tamarisk in this area.
- Area 5 (Charleston Road to Hwy 82): Tamarisk survey and control has not been initiated in this area, and will be planned for 2013. Area 5 survey area is 452 acres. The number of tamarisk in this area is increasing from south to north, and is estimated at 15 acres (3%).
- Area 6 (Hwy 82 to Land Corral): Tamarisk survey was contracted by BLM to the Sonoran Institute. Area 6 includes 750 acres surveyed by the Sonoran Institute during 2009, with 332 acres affected and 125 acres infested with tamarisk (area affected is determined from mapped polygon boundaries, while area infested is a measurement of the actual area and percent cover). This area is so heavily infested with tamarisk that control efforts will be more difficult in that more funding and time will be required, as well as possible revegetation planning and completion. This area is not scheduled at this time, except for some initial control beginning at Hwy 82 and moving progressively north until active revegetation would be required. This area would be scheduled for control once all other treatment areas are complete, due to the high density of tamarisk already present.
- St. David Cienega: This area is estimated at 301 acres. Control is planned for fall of 2011 and spring of 2012. Prescribed fire may be utilized to remove slash piles created by the cut-stump method, and as a restoration tool for the cienega. The tamarisk infestation is estimated at 15 acres (5%).
- Springs and tributaries: Control at Murray Spring and Contention Springs occurred during the spring of 2011, and is

estimated at less than one acre for 10 acres surveyed (1%). Continuing control at springs and tributaries will occur as each treatment area is reached; the number of tamarisk is estimated to be low.

## **2) How are the trees going to be cleared? (agra axe, chain saw, push):**

The cut-stump, selective method for control was used for treatment in the Palominas and Hereford treatment areas during 2009-2010, using a 100% solution of glyphosate or a 9% solution of imazapyr, per label directions. For foliar spray of small (<5' high) tamarisk, a 1.5% glyphosate or 1% imazapyr solution was used. The cut-stump method will continue to be utilized to selectively remove and treat tamarisk, using the Arizona State Forestry Division Wildland Fire Crews. Foliar spray will continue to be used on small tamarisk. The BLM Wildlife Biologist applied, or directly supervised, all herbicide application under current Arizona commercial applicator certificates. Various members of the Gila District fire crew provided chain-saw labor and branch removal over seven days during 2009 and one day during 2010. The Arizona State Forestry Division Wildland Fire Crews provided chain-saw labor and branch removal over seven days during 2010. The remaining nine days of herbicide treatment was provided by BLM staff. Tamarisk control has continued during 2011 at Murray and Contention Springs by BLM staff, and fall 2011 control will focus on the remainder of the Waters Road to Hereford section (Area 2), the Hereford to Hwy 90 section (Area 3), and the St. David Cienega (due to the unique habitat type).

- Area 1 (International Boundary to Hwy 92): This area has been treated during 2009-2011 and is currently approximately 99% tamarisk-free. There are about six isolated tamarisk trees that were overlooked during treatment; these will be controlled during a follow-up visit. Cost for completing this area is estimated at \$800 (one day for Wildland Fire Crew).
- Area 2 (Waters Road to Hereford Road): Tamarisk control in Area 2 was initiated during 2010 on approximately one acre of the 100 acres surveyed. There is an estimated one acre of tamarisk control remaining in Area 2, for a total of 2% of tamarisk. Cost for completing this area is estimated at \$1600 (two days for Wildland Fire Crew).
- Area 3 (Hereford Road to Hwy 90): Tamarisk control in Area 3 was initiated during 2010, and included five tamarisk on the east side of the San Pedro River. Tamarisk survey and mapping is complete, and includes approximately two acres of tamarisk in the 410 acres surveyed (less than 1%). Cost for completing this area is estimated at \$2400 (three days for Wildland Fire Crew).
- Area 4 (Hwy 90 to Charleston Road): Tamarisk survey and control has not been initiated in this area, and will be planned for 2012. Area 4 survey area is 198 acres. There is little tamarisk in this area. Cost for completing this area is estimated at \$1600 (two days for Wildland Fire Crew).
- Area 5 (Charleston Road to Hwy 82): Tamarisk survey and control has not been initiated in this area, and will be planned for 2013. Area 5 survey area is 452 acres. The number of tamarisk in this area is increasing from south to north, and is estimated at 15 acres (3%). Cost for completing this area is estimated at \$3200 (four days for Wildland Fire Crew).
- Area 6 (Hwy 82 to Land Corral): Tamarisk survey was contracted by BLM to the Sonoran Institute. Area 6 includes 750 acres surveyed by the Sonoran Institute during 2009, with 332 acres affected and 125 acres infested with tamarisk (area affected is determined from mapped polygon boundaries, while area infested is a measurement of the actual area and percent cover).
- St. David Cienega: This area is estimated at 301 acres. Control is planned for fall of 2011 and spring of 2012. Prescribed fire may be utilized to remove slash piles created by the cut-stump method, and as a restoration tool for the cienega. The tamarisk infestation is estimated at 15 acres (5%). Cost for completing this area is estimated at \$3200 (four days for Wildland Fire Crew).
- Springs and tributaries: Control at Murray Spring and Contention Springs occurred during the spring of 2011, and is estimated at less than one acre for 10 acres surveyed (1%). Continuing control at springs and tributaries will occur as each treatment area is reached; the number of tamarisk is estimated to be low.

## **3) What is the estimated number of trees per acre?**

The number of trees per acre depends on the location along the San Pedro River.

- Area 1 (International Boundary to Hwy 92): This area has been treated during 2009-2011 and is currently approximately 99% tamarisk-free. There are about six isolated tamarisk trees that were overlooked during treatment; these will be controlled during a follow-up visit. Area 1 contains 200 acres that were surveyed for tamarisk. Of this acreage, approximately 10 acres (or 5% of the 200 acres surveyed) of tamarisk was treated using the cut-stump or foliar method.
- Area 2 (Waters Road to Hereford Road): Tamarisk control in Area 2 was initiated during 2010 on approximately one

acre of the 100 acres surveyed. There is an estimated one acre of tamarisk control remaining in Area 2, for a total of 2% of tamarisk.

- Area 3 (Hereford Road to Hwy 90): Tamarisk control in Area 3 was initiated during 2010, and included five tamarisk on the east side of the San Pedro River. Tamarisk survey and mapping is complete, and includes approximately two acres of tamarisk in the 410 acres surveyed (less than 1%).
- Area 4 (Hwy 90 to Charleston Road): Tamarisk survey and control has not been initiated in this area, and will be planned for 2012. Area 4 survey area is 198 acres. There is little tamarisk in this area.
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- Springs and tributaries: Control at Murray Spring and Contention Springs occurred during the spring of 2011, and is estimated at less than one acre for 10 acres surveyed (1%). Continuing control at springs and tributaries will occur as each treatment area is reached; the number of tamarisk is estimated to be low.

**4) Describe trees to be cleared (species, estimated diameter, single stem, multi-stem):**

The majority of tamarisk to be cleared includes multi-stemmed trees of up to approximately 12' in height and one to three inch in diameter, ranging from about 1% to 5% of the acreage surveyed per treatment area.

**5) Describe terrain (slope, soil type, rocks, etc.)**

Average elevation is approximately 3900', and soils are generally Brookline-Fluvaquents-Riverwash complex, 0 to 3 percent slopes. Areas scheduled for tamarisk control are generally easily accessible by administrative roads.

**6) Please list any special land management status for the project site (i.e. Wilderness, National Park, National Monument, etc). If private land, list landowner.**

USDI-Bureau of Land Management, National Landscape Conservation System, San Pedro Riparian National Conservation Area

**7) Please provide the following information about access to the proposed site:**

Type of access (mark one):  2x4 vehicles  4x4 only  foot only\*\*

\*\*If foot access only: Distance in miles: \_\_\_\_\_ Approx. hiking time: \_\_\_\_\_

Treatment areas are generally accessible to vehicles through roads authorized for BLM administrative use. Four-wheel drive vehicles are usually not required. Hiking time to treatment area from administrative roads is usually less than a few minutes.

Does access to this site require crossing private or tribal lands?  YES  NO

Is the site relatively accessible for tree shearing equipment?  YES  NO

Please describe any restrictions to public access:

See Sportsmens' access/hunting opportunities described above.

**PROJECT COMPLETION REPORT**

(Please complete the report and forward to Game Branch  
within 30 days of the completion of the project. THANK YOU!)

**Project Title:** \_\_\_\_\_

**Project number:** \_\_\_\_\_

**GMU:** \_\_\_\_\_

**Project Coordinator (IF NOT APPLICANT):** \_\_\_\_\_

**Agency:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

**Phone:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**Project Completion Date** \_\_\_\_\_

**COOPERATING AGENCIES AND/OR CONSERVATION GROUPS, LANDOWNERS, ETC.:**

**PROJECT ACCOMPLISHMENTS:**

**PROJECT RESULT ACTIONS:**

(List practices implemented as a result of project, i.e. area rested from grazing for 2 yrs., season recommendations revised based on new distributions, data received from project, etc.)

**COMMENTS ABOUT THE PROJECT:**

(Please list updates, reports, concerns, suggestions)

**MAINTENANCE/MONITORING SCHEDULE (from this point on): WHO and WHEN?**

**PHOTO:** (Please attach)

**MAIL COMPLETED PROJECT COMPLETION FORM TO:**

**Arizona Game and Fish Department**

Attn: Game Branch

**5000 W. Carefree Highway**

**Phoenix, AZ 85086**

**[@azgfd.gov](mailto:azgfd.gov)**

# Woody Invasives Removal Cost Tracking Form

Version 2-14-2011

Contact Chris Massingill, Mainstream Contracting, with questions or to contribute projects to the database. Cell phone (541) 653-6115 or [chris@ecomainstream.com](mailto:chris@ecomainstream.com). Project sponsored by the Walton Family Foundation.

---Project area is defined: 1) ideally as a defined area of treatment with relatively homogeneous features, or 2) a reasonably homogeneous area treated during a given amount of crew time (e. g. hitch or river trip).  
 ---Spatial extent and percent cover need to be determined as accurately as possible.  
 ---Labor used will typically be conservation corps crews, volunteers, agency-hired crews, local contractors or national level contractors. More than one crew type may be used for a given task and should be listed separately with details described in the the notes.  
 ---This form assumes that higher level basin planning has been completed for implementation and monitoring. Costs for planning and monitoring documented here are for location specific treatments.

Project summary information	Costs	Descriptions	Instructions
Lead organization		Bureau of Land Management	The lead organization sponsoring the project (receiving funding for removal efforts)
Other organizations involved		Arizona State Forestry Division	Other organizations involved in the project
River basin and/or Tributary		Upper San Pedro	E.g. Dolores, Escalante, Dolores/Disappointment Creek
Project Name		San Pedro Riparian National Conservation Area	Property, reach, unique identifier (e.g. Boulder Creek - Smith property, or Willow Creek - miles 12.5 to 13.5)
Property ownership		BLM	Is ownership private, state, BLM, NPS, etc.
Invasive(s) targeted		tamarisk	E. g. tamarisk, Russian olive, elm. If a mixture, indicate proportion of each and which species treated. D28+D27
Acreage treated		12	The number of acres where invasives were physically removed
Area covered		1500	The number of acres where invasives were checked for and cleared and/or total acreage of the property.
Method of delineating area/density		GPS	GPS, aerial photos/GIS, buffered line, ocular estimate, pre- or post- cutting
Total cost	29080		Total cost of the project. Compilation of costs listed below.
Notes/comments			Any general features of the project not listed above

General description of project			
Avg density of patch		80	Average percent cover, 10% increments
Average ht/diameter of stems		10'	Average height of tamarisk or stem diameter of Russian olive
Remoteness		Various	In town, <5 miles, 5-10 miles, 10-20, 20-50, 50+
Access		access, usually	Road access, short hike access (<0.5 mile), long hike (>0.5 mile), float, etc.
Typical project area slope		Flat	Flat, moderate, steep
Method of removal		Chainsaw, lopers	Hand tools only, chainsaw cutting, hydro-axe, etc.

Weather/environmental factors		Mild	Heat, cold, insects, flooding, or other environmental factors that impacted project efficiency. Rate as mild/mod/severe for overall impact to project costs.
Notes/comments			Other factors not listed here that <i>impacted total project costs</i> , i.e. crew attrition, change in leadership, etc. Don't include time that was made up later or otherwise accommodated.

<b>Project Management</b>	3640	GIS support, EA, and consultation with FWS	Costs incurred by the grantee for site planning, contract management, interactions land owner/manager, GIS support of project, field mapping, grant administration and reporting, etc.
<b>Additional project managers</b>			Combined costs associated with participating organizations (primarily time spent and materials), though costs not directly billable to the grant.
Participating partner activities		BLM staff for cut-stump, Arizona State Forestry Division for cut-stump	Describe activities performed by different partners (i.e. BLM crews for spraying - \$2500, NPS crews for biomass burning - \$1500)
Notes/comments			

<b>Housing logistics</b>	0	None	Lodging, food, camping fees, time spent moving lodging
Notes/comments			

<b>Training costs</b>	440		Cost of training crew members in cutting, safety, ecology, etc. (on project time)
Number of people trained		10	Number of crew members trained

<b>Travel/access costs</b>	200		Costs related to travelling to the site and/or special logistics for access to the site such as time required for hiking in, costs for renting rafts, horse-packing equipment, etc.
Notes/comments		Gas	

<b>Costs for cutting and piling</b>			
Labor used		Arizona State Forestry Division, BLM staff, SCA interns	Conservation corps, agency staff, volunteers, local contractor, national contractor, etc.
Experience level of crew		High	Low, moderate, or high
Number of crew members		12/day	How many people, on average, participated in cutting activities
Days spent cutting		14	Number of days spent cutting (per crew)
Notes/comments			
Labor cost	7000		Costs for time
Materials/equipment cost	500		Costs for materials or equipment needed for cutting
Removal subtotal	7500		Total costs for cutting and piling

<b>Costs for biomass removal</b>			
Labor used		Not removed	Conservation corps, agency staff, volunteers, local contractor, national contractor, etc.

Method used		Not removed	Method for biomass removal (mulching, burning, cutting for firewood)
Number of crew members		Not removed	How many people, on average, participated in biomass removal activities
Days spent on removal		Not removed	Number of days spent on biomass removal
Notes/comments			
<i>Labor cost</i>	0	None	Costs for biomass removal efforts
<i>Material/equipment cost</i>	0	None	Costs for supplies/equipment for removal, i.e. chipper rental, fuel for fire crews.
<u>Biomass removal subtotal</u>	0	None	Total costs for biomass removal

<b>Costs for herbicide treatment</b>			
Labor used		Agency staff, SCA, volunteers, Arizona State Forestry Division	Conservation corps, agency staff, volunteers, local contractor, national contractor, etc.
Number of crew members		12	How many people, on average, participated in herbicide application activities
Days spent on herbicide treatment		14	Number of days spent on herbicide treatment
Notes/comments			
<i>Labor cost</i>	10080		Costs for application of herbicide (time)
<i>Cost for herbicide manager</i>	4480		Cost for manager providing oversight, materials, support, etc.
<i>Cost for certified applicator</i>			Cost for certified applicator time, if applicable
<i>Material/equipment cost</i>	2000		Costs for sprayers, herbicide, personal safety equipment, etc.
<u>Herbicide treatment subtotal</u>	16560		Total costs for herbicide treatment

<b>Costs for monitoring</b>			
Labor used for collection		BLM staff, Sonoran Institute contract	Site-based monitoring of effectiveness, veg response, etc. Contractor, agency staff, volunteers, other
Labor used for analysis/reporting		BLM staff, Sonoran Institute contract	Contractor, agency staff, volunteers, other
Time spent (collection and analysis)		2	How many days spent collecting and analyzing data
Notes/comments			
<i>Collection cost</i>	640		Cost for crew time collecting data, before and after photos, etc.
<i>Analysis/reporting cost</i>	100		Cost for analysis of data collected and reporting results
<u>Monitoring costs subtotal</u>	740		Total costs for monitoring

Costs for Initial Active Restoration			
Labor used		Not needed	Conservation corps, agency staff, volunteers, local contractor, national contractor, etc.
Notes/comments		Native vegetation remains with no need for active restoration at this time in project	
Labor cost	0	Not needed	Planting vegetation, preparing sites for planting, control of other weeds, etc.
Material/equipment cost	0	Not needed	Cost of stock planted, tools needed, etc.
Active restoration subtotal	0	None	Total costs for initial restoration