

Decision Tool for Proposed Action-
Revised 3/9/15

The following Project Decision Tool is designed for use by managers to assist in determining how proposed projects meet the above described San Rafael State Natural Area vision, goals and objectives.

The checklist is intended for use by park managers to ensure that management decisions also meet federal and state laws and policies, and identify where and when involvement of State Parks managers and/or executive staff might also be required.

The Decision Tool is intended to document proposed activities and identify mitigation actions as necessary. Managers can use the documentation to communicate their decisions to ASP Executive Staff or others as appropriate.

In efforts to better educate and formulate decisions related to proposed projects, a baseline understanding of Natural Area resources should be considered. *Monitoring and inventory of resources is an important factor in making decisions about how a project may, or may not meet management objectives for SRSNA.*

**ARIZONA STATE PARKS
SAN RAFAEL STATE NATURAL AREA**

PROPOSED PROJECT INFORMATION SHEET

PROJECT TITLE:	
ASP PROJECT LEAD: (Decision-making authority)	PROJECT PROPONENT:
Include contact info	Include contact info
ASP PROJECT COORDINATOR: (Day to day oversight)	
PROJECT FUNDING: <input type="checkbox"/> ASP Internal <input type="checkbox"/> Federal <input type="checkbox"/> Other List _____ <small>(double click box to check/uncheck)</small>	
PROJECT START DATE: (Should include any on ground preparation, etc)	
PROJECT END DATE: (Should include any repair, etc.)	
COOPERATIVE PARTY(IES):	
GENERAL PROJECT LOCATION	

BACKGROUND

Provide a description of project / program background and project setting

PURPOSE AND NEED

Describe the purpose and need for the proposed project.

PROJECT/PROGRAM DESCRIPTION

Provide a complete description of the proposed project and include the following information, if applicable: equipment/tools to be used, total acreage of surface disturbance; potential impacts; alternatives considered in order to avoid or minimize impacts; and anticipated implementation date and duration of project. Attach any project documentation, existing plans, blueprints, protocols, and maps.

MANAGEMENT OBJECTIVE / STRATEGY

Identify existing SRSNA Management Resource Goals/Strategies that the project or program is consistent with and may be tiered to. How will the project further the protection, conservation and/or management of those resources?

PROJECT MITIGATION

If impacts to resources (as described in the SRSNA Management Framework Plan) are anticipated, how will they be monitored and mitigated?

PROJECT MAP

Ensure that the final project map contains the project title, legal description, and all components of the project, scale, quad name, and north indicator.

COORDINATION

List anticipated or already determined coordination on this project.

FEDERAL NEXUS

Is federal funding anticipated as a funding source for the project?

No Yes If Yes, list source:

Does the project extend onto federal lands?

No Yes If Yes, list agency:

Is a Federal Permit required to carry out the activity? (i.e., is NEPA compliance required?)

No Yes If Yes, list agency:

_____ Is ASP compliant?

_____ No Yes If no, next steps?

_____ Is a Habitat Conservation Plan required?

No Yes

**ARIZONA STATE PARKS
SAN RAFAEL STATE NATURAL AREA**

ENVIRONMENTAL / CULTURAL ASSESSMENT CHECKLIST

PROJECT TITLE:

WILL THIS PROJECT:

Yes	No	
<input type="checkbox"/>	<input type="checkbox"/>	<u>1.</u> Include planned construction, major modifications, emergency construction or additions to buildings, roads, parking and passenger loading zones, walkways, trails, accessibility including ADA compliance, public use facilities, water control structures or impoundments
<input type="checkbox"/>	<input type="checkbox"/>	<u>2.</u> Affect any species protected under the Endangered Species Act, their designated Critical Habitat and/or candidate species? (Check yes for positive and/or negative impacts) If yes, identify species and impact(s). (Must be updated every 6 months)
<input type="checkbox"/>	<input type="checkbox"/>	<u>3.</u> Is a permit needed to cover management actions that have the potential to impact ESA listed species?
<input type="checkbox"/>	<input type="checkbox"/>	<u>4.</u> Affect any species listed as Wildlife of Special Concern in Arizona (Procure list of potentially residing species from
<input type="checkbox"/>	<input type="checkbox"/>	<u>5.</u> Include the introduction of or exportation of any species not presently or historically occurring in the receiving location?
<input type="checkbox"/>	<input type="checkbox"/>	<u>6.</u> Directly necessitate mortality or displacement of native plants, fish or wildlife, either intentionally or incidentally?
<input type="checkbox"/>	<input type="checkbox"/>	<u>7.</u> Cause any ground disturbance or affect any archaeological, historical, paleontological resource, religious shrine or cultural site?
<input type="checkbox"/>	<input type="checkbox"/>	Alter <u>8.</u> Alter the aesthetics of the area including adverse effects on scenic resources (e.g. trees and rock outcrops) or degrade the visual character or quality of the site and its surroundings?
<input type="checkbox"/>	<input type="checkbox"/>	<u>9.</u> Be expected to have organized opposition, or generate substantial public controversy?
<input type="checkbox"/>	<input type="checkbox"/>	<u>10.</u> Involve land use such as planting, burning, clearing, grazing, or modification of public use?
<input type="checkbox"/>	<input type="checkbox"/>	<u>11.</u> Involve the manipulation or use of surface or groundwater, or modify or deny access for water usage?
<input type="checkbox"/>	<input type="checkbox"/>	<u>12.</u> Involve any modification to, or development in a flood plain or wetland or affect drainage patterns?
<input type="checkbox"/>	<input type="checkbox"/>	<u>13.</u> Result in any activity that will conflict with federal or state air or water quality regulations?
<input type="checkbox"/>	<input type="checkbox"/>	<u>14.</u> Include use or potential release of any toxicant?
<input type="checkbox"/>	<input type="checkbox"/>	<u>15.</u> Have any environmental impacts not addressed above, or result in cumulative impacts that separately do not require assessment but together may be considered substantial?
<input type="checkbox"/>	<input type="checkbox"/>	<u>16.</u> Require any federal, state or other permits? (Clean Water Act Sec. 401, 404; Arizona Department of Agriculture Salvage Permit; ROW for access; Arizona Department of Water Resources Well Drilling or Surface Water Right Filing, Section 10, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	<u>17.</u> Other NEPA compliance completed, and attached. (Federal EA, FONSI, DN, BA, ROD)

ARIZONA STATE PARKS
SAN RAFAEL STATE NATURAL AREA

ENVIRONMENTAL / CULTURAL ASSESSMENT CHECKLIST

EXPLANATION OF "YES" RESPONSES

PROJECT TITLE:

IDENTIFY THE ITEM LETTER(S) AND PROVIDE A DETAILED EXPLANATION:

Operations: For any item that received a "yes" response, describe the impact(s) or issue(s) and explain information or actions that will be implemented to address/resolve the particular item(s).

ARIZONA STATE PARKS
SAN RAFAEL STATE NATURAL AREA

ENVIRONMENTAL / CULTURAL ASSESSMENT CHECKLIST

INTERNAL PERMIT/DOCUMENTATION CHECKLIST

PROJECT TITLE:

		Not Applicable	Pending	Completed
HDMS Check <u>(AZG&F)</u>				
Require a Special Use Permit?				
Federal Documentation:	<p>NEPA</p> <p><input type="checkbox"/> <u>Categorical Exclusion</u></p> <p><input type="checkbox"/> Environmental Assessment</p> <p><input type="checkbox"/> <u>Environmental Impact Statement</u></p> <p><input type="checkbox"/> <u>Environmental Impact</u> Statement</p> <p><input type="checkbox"/> Record of Decision (NEPA)</p> <p>Fish & Wildlife Service - Consultation</p> <p><input type="checkbox"/> Biological Assessment</p> <p><input type="checkbox"/> Biological Evaluation</p> <p>Other</p> <p>(F&WS) <input type="checkbox"/> Memorandum of <u>Understanding Understanding</u></p> <p><input type="checkbox"/> <u>Categorical Exclusion</u></p>			
404 Permit (ACOE) - <u>Clean Water Act</u>				
401 Permit (ADEQ) - <u>Discharge water</u>				
Cultural Resource Clearance / SHPO Clearance				
Arizona Game and Fish Department				
U.S. Fish and Wildlife Service				
Department of Agriculture				
Arizona Department of Water Resources				
Board or Director Approval				

Landowner Coordination	<input type="checkbox"/> _____	<input type="checkbox"/> _____			
	<input type="checkbox"/> _____	<input type="checkbox"/> _____			
Management Plan Review	<input type="checkbox"/> _____				
Other	<input type="checkbox"/> _____ <input type="checkbox"/> <input type="checkbox"/> _____ <input type="checkbox"/>				

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ARIZONA STATE PARKS
SAN RAFAEL STATE NATURAL AREA

ENVIRONMENTAL / CULTURAL ASSESSMENT
CHECKLIST
SIGNATURES

PROJECT TITLE:

Project Coordinator _____ Date _____

Project Leader _____ Date _____

Resource Management _____ Date _____

Operations _____ Date _____

Director _____ Date _____

Appendix A

A White Paper
San Rafael State Natural Area and Grazing
by
NAPAC

Background

The San Rafael Ranch and Cattle Company was established by cattle rancher Colin Cameron and later acquired by Colonel William Greene in 1903. His daughter, Florence Sharp, later inherited the Cattle Company and its associated land. The Sharp family operated the San Rafael Cattle Company and Ranch for more than 95 years. The Nature Conservancy recognized the ecological value of the area and purchased the Ranch from the Sharp family in 1998. In 1999, Arizona State Parks purchased the 3,557 acres on the southern section and established it as the San Rafael State Natural Area. The SRSNA remains subdivided into 6 pastures.

The remaining 17,574 acres were sold to a private landowner, but are protected by a Conservation Easement managed by Arizona State Parks. The 17,574 acres continue to be operated as a working cattle ranch.

Since its establishment as a Natural Area in 1999, the grasslands, wildlife species, and riparian areas on the SRSNA have been monitored intermittently as funding was available. There have been various approaches recommended on how to manage these resources; from the strictest natural resource protections to allowing other uses, including grazing, public access, and cultural and historic resource education and outreach. NAPAC has struggled over the years with how to balance protection and conservation of natural resources with allowing grazing on lands set aside for their natural resources.

The SRSNA Management Planning Framework is designed to recognize and protect the natural and cultural resources on the natural area. The current draft does not include livestock grazing as a goal or strategy, or as a recommended management tool. Should State Parks decide to implement grazing as a management tool or to authorize it for other reasons, NAPAC recommends that both positive and negative impacts be analyzed using the Decision Tool.

The following is a brief chronology of grazing activities on the SRSNA:

- March 16, 2006 – ASP Board approved a NAPAC recommendation for a policy to be developed that included implementation guidelines for livestock grazing management and monitoring on natural area properties. The policy stated:

The ASP Board develops and adopts a policy and implementation guidelines that incorporate the following provisions:

- No permitted livestock grazing shall be allowed on Natural Areas properties unless grazing benefits the natural area values for which the property was acquired, and
- On Natural Area properties currently owned by State Parks, no livestock grazing shall be permitted without a properly reviewed and implemented comprehensive natural resources management plan. The comprehensive natural resources management plan for the Natural Area shall include a grazing management plan and appropriate monitoring design. The grazing plan component should be developed by a credible organization such as the Natural Resources Conservation Service.

In addition, the Board asked that staff and NAPAC work on specific plans and guidelines related to each State Parks' operated natural area and present them to the Board at a later date.

- On June 16, 2010 the Board approved an action that allowed the Executive Director to enter into an agreement for grazing activities at the SRSNA that was to be consistent with the above outlined policy, including a grazing management plan and a periodic monitoring program. However, additional grazing activities were permitted on the SRSNA without the benefit of a grazing management or monitoring plan in place.
 - A Special Use Permit was issued to Ross Humphreys for June 17-September 17, 2010.
 - A Special Use Permit was issued to Ross Humphreys for August 15-November 15, 2011.
 - In 2012 no livestock grazing was requested or took place on the SRSNA.
 - A 2013 request has been made that differs from past requests including a longer grazing duration and through Spring and Summer seasons which are critical growing and reproductive seasons for a number of plant and wildlife species.

In previous years, Grazing Plans consisted of email summaries to staff. We are unsure what type of monitoring may have been conducted. No records have been found.

Potential Benefits of Grazing

NAPAC recognizes that grazing can sometimes be beneficial to resources, including wildfire hazard reduction, removal of some non-native invasive plants, and opening up spring habitats for the benefit of some species. In addition, grazing of cattle, along with general ranching activities, can provide a "presence" on the land, to help allay impacts from illegal activities and unauthorized livestock activities. In these cases, grazing may effectively be used as a management tool. Grazing fees may contribute to management of SRSNA.

However, we suggest that the Decision Tool be used to determine if the action meets the goals and objectives for the SRSNA, to describe specific benefits, and to mitigate any impacts. If the action of allowing grazing is determined to be acceptable/appropriate, a grazing plan (see Grazing Plan Elements) needs to be established for the natural area proposed for such use, including baseline settings, monitoring (range condition and annual actual use), and results of post-grazing activities to address short-term impacts and long-term trends.

Potential Negative Impacts of Grazing

- Introduction and/or, dispersal of invasive non-native plants.
- Impacts from movement of cattle between pastures such as mowing, trailing, trampling.
- Trampling and resultant erosion impacts to spring and riparian habitats.
- Potentially negative impacts to T & E species by destruction of habitat from heavy grazing and trampling damage, possible death or injury from trampling, competition for food, water and cover.
- Financial impact of constructing and maintaining range improvements such as developed waters, additional fences, change of fencing to wildlife-friendly configuration, etc.
- Impacts of pasture fences on wildlife such as entanglement and inhibiting movements.

NAPAC Recommendations

The SRSNA is one of only a couple of relatively intact remnants of southwestern grassland habitat remaining in the region. The total acreage of these remaining lands is small compared with the original expanse of these habitats that were present prior to introduction of livestock in the region, and they are deserving of protection for current and future generations. These special resources should be preserved to provide opportunities for recreation, wildlife viewing and education, interpretation, and research in the face of continued human development and modifications of the natural environment. Issues associated with fire and illegal activities may be addressed using alternative methods.

In the event ASP pursues grazing as a management tool to progress towards the stated Desired Future Conditions, NAPAC recommends a specific grazing plan be developed for the natural area proposed for such use and that the Decision Tool be used to identify how the action tiers to management goals and strategies, and if impacts are anticipated, how those impacts might be mitigated.

Within the framework of the Decision Tool and development of a grazing plan, NAPAC recommends the following issues be addressed:

- Evaluate need to add fences around springs to provide for site-specific management opportunities, protection of aquatic and riparian resources
- Establish water for livestock outside of spring or river exclosures as needed to provide for improved management flexibility
- State Parks should work with USFWS and other agencies to develop a Habitat Conservation Plan or a Safe Harbor Agreement to ensure management actions, including grazing, mitigate any impacts to T & E and other special status species.
- Arizona State Parks should consider a peer review of any drafted grazing plan, and finalized grazing plans should be made readily available in the public domain. The general public may also provide input on draft grazing plans during open meetings of NAPAC.
- Revenues from Special Use Permits issued for grazing should be allocated back to the SRSNA to benefit management of the resource (e.g. monitoring and research). In addition. ASP should establish grazing fees that will support the cost of necessary monitoring activities.

Grazing Plan Elements

1. Existing Baseline Conditions (ideal) of vegetative cover and grass composition
2. Updated map (ground truthing and GIS updates), with boundary fences, interior fences, water developments, trailing routes, gates, etc.
3. Prior to the start of livestock grazing, all range improvements (fences, water developments, etc.) will be inspected and maintained to ASP standards by the permittee. If new developments or major reconstruction of existing developments are identified, the costs for this work will be negotiated between ASP and the grazing permittee.
4. Annual operating plan to include:
 - i. Number and class of livestock permitted
 - ii. Schedule of pasture use following a deferred or rest rotation system
5. Movement of cattle from one pasture to another will be based on grazing utilization rates as defined:
 - i. 35-40% utilization of key grass species (See Ruyle, 2007 for these grass species)
 - ii. Grazing permittee will keep actual use records and contact ASP about deviations from agreed upon Annual Operation Plan, including numbers of cattle, modifications of pasture movement and timing.
6. End of year grazing report provided by Grazing Permittee to include:

- i. Number of, and class of cattle in each pasture
- ii. Pasture use dates
- iii. Trailing routes used between pastures
- iv. Best estimate of utilization rates – State Parks or assigned designee will review draft end-of-year report and make at least one joint inspection during each grazing season.

Monitoring vegetative conditions and grassland species composition by Arizona State Parks

NAPAC recommends that ASP monitor vegetative conditions and grassland species composition over time to determine longer term trends towards meeting Desired Future Conditions, and to ensure timely action to mitigate any negative effects of management activities, including grazing, and/or climatic impacts such as drought.

For monitoring methodology, refer to the 2007 Rangeland Monitoring on the San Rafael de la Zanja Conservation Easement by George Ruyle and others (including recommendations on page 89) in conjunction with advice and directions from the Natural Resource Conservation Service, USDA.

Appendix C

Special Status and Key Fish, Wildlife and Plant Species

The SRSNA supports a diverse suite of fish, wildlife and plant species that occur in the Sky Island Mountain region of the Southwestern United States and Northern Mexico. The SRSNA is important to resident, migratory and transitory species in the region. Goals for the SRSNA include the protection, preservation and enhancement of habitat for all wildlife.

Arizona State Parks, as stewards of public lands such as the SRSNA, has the responsibility of managing these properties in an ecologically responsible manner, such that these irreplaceable resources are preserved in perpetuity for future generations. Responsibilities of management include compliance with a variety of federal and state laws that pertain directly or indirectly to the protection of these resources including: the National Environmental Policy Act (NEPA), U.S. Endangered Species Act (ESA), Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, Federal Water Pollution Control Act (“Clean Water Act”), Arizona Revised Statutes, and others. Due to the high species diversity in the Sky Island Mountain region, a correspondingly large number of special status species are present or potentially occur in the SRSNA area. ASP must address these species with appropriate management activities on the SRSNA. Since all life is integrated into ecosystems, a more effective management strategy will employ a large-scale ecosystem approach rather than only a species-based focus.

This appendix contains two tables, which provide a current (June 2013) list of special status species known or potentially occurring within the SRSNA (Table C1), and species-specific information for key fish, wildlife and plant species that have been actively studied and/or managed in recent years, that are currently being studied or managed, or that are planned to receive such efforts (Table C2). Table C1 was compiled using the current AZGFD Heritage Data Management System information for Santa Cruz County, and was augmented with data from a variety of sources including site-specific information (McLaughlin 2006; AZGFD 2009; 2006; IBA 2013), and a variety of regional literature. An analysis of special status species potentially occurring on the SRSNA was performed, and species with little or no potential for occurrence due to lack of suitable habitat, were removed. Species highlighted green in Table C1 have been recorded on the SRSNA. Most of these species have a regular presence at SRSNA, but the presence of some are based only on historic records. Species highlighted yellow in Table C1 have not been recorded on the property, but are species for which there is suitable habitat on the SRSNA, and for which there are records in proximity to the SRSNA (including Mexico). Because there are no Bureau of Land Management (BLM) lands contiguous with or in proximity to the SRSNA, BLM sensitive species were not included in the data set.

Table C2 includes key special status species that have recent or on-going efforts to monitor, protect or reestablish their presence in the area. The purpose of this table is to provide information about studies and contacts, cooperating agencies and personnel associated with these activities. This table should be regularly maintained and updated to allow Arizona State Parks to remain current and proactive in implementing these cooperative ecological resource activities. ASP should actively promote the welfare of fish, wildlife and plant resources that use or occur on the SRSNA through collaborative efforts with agencies and other regional stakeholders.

The ecology of the region is dynamic and changes over time due to natural processes, including the effects of man. Since species composition and populations may be in a state of flux at any given time, species that are not currently known to be present within the SRSNA may be discovered, or appear at any time. While management should be focused at the ecosystem level, working with management indicator (key) species is an effective management tool that allows for appropriate monitoring of natural resources on the SRSNA. Managers must be cognizant of the potential for change in the suite of species that may require specific management efforts, and may refer to Table 1 as a guide in accomplishing this task. Implementation of the ASP Research Inventory and Monitoring (RIM) program at SRSNA will assist ASP managers with staying current on the status of special status species.

Overarching Recommended Action: Arizona State Parks will work with coordinating partners to develop a protocol to share data, reports, and assessments of conditions and species on the SRSNA.

With the cooperation and assistance of the USFWS and the AZGFD ASP will maintain records and track trends, progress and conditions over time for each species listed in Table 2. ASP will periodically monitor for the presence of previously unidentified special status species occurring on the SRSNA. ASP will report findings to leaders and executive team members on a regular basis.

Appendix B

List of existing Surface Water Rights Filings located on the San Rafael State Natural Area, as of 2012

<u>SWR Filing</u>	<u>Permit #</u>	<u>Certificate</u>	<u>Priority</u>	<u>File Date</u>	<u>Holder Name</u>	<u>Water Sour</u>	<u>Use1</u>	<u>Use2</u>	<u>Use3</u>
33-28616.0	28616	28616	6/17/1974	6/17/1974	San Rafael Cattle Co	P Twenty Four	25.0 Cows / Horses	Using 60,000 Gpa For Stock	
33-35887.0			2/11/1976	2/11/1976	Nogales, City Of	Santa Cruz	Using 0.0 Gpa For Municipal		
36-104705.0			1/11/1822	9/28/1990	San Rafael Cattle Co	#14 Tank	Using For Stock	Using For Irrigation	Using For Domestic
36-104706.0			1/11/1822	9/28/1990	San Rafael Cattle Co	#15 Tank	Using For Stock	Using For Irrigation	Using For Domestic
36-104707.0			1/11/1822	9/28/1990	San Rafael Cattle Co	#16 Tank	Using For Stock	Using For Irrigation	Using For Domestic
36-104738.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well E Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104741.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well H Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104739.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well F Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104725.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #17 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104726.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #18 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104727.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #19 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104730.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #086138 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104731.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #086139 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104732.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #602653 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-104733.0			1/11/1822	9/28/1990	San Rafael Cattle Co	Well #602654 Waters	Using For Stock	Using For Irrigation	Using For Domestic
36-63838.1			18501231	5/2/1978	Az State Parks Board	P #27 Spring	Using 5,184,000.0 Gpa Annual	Using For Stock	
33-28604.1	28604	28604	6/17/1974	6/17/1974	Az State Parks Board	P #1 Draw	20 Cows/Horses Using 36,000 Gpa	For Stock	
33-28617.1	28617	28617	6/17/1974	6/17/1974	Az State Parks Board	P #26 Draw	80 Cows/Horses Using 264,000 Gpa	For Stock	

Table C1

SCIENTIFIC NAME	COMMON NAME	ESA	USFS	MEXFED	STATE	SGCN
AMPHIBIANS						
<i>Ambystoma mavortium stebbinsi</i>	Sonoran Tiger Salamander	LE			WSC	X
<i>Lithobates chiricahuensis</i>	Chiricahua Leopard Frog	LT		A	WSC	X
<i>Ollotis (Bufo) alvarius</i>	Sonoran Desert Toad					X
BIRDS						
<i>Ammodramus bairdii</i>	Baird's Sparrow	SC	S		WSC	
<i>Ammodramus savannarum ammolegus</i>	Arizona Grasshopper Sparrow		S			X
<i>Anthus spragueii</i>	Sprague's Pipit	C			WSC	X
<i>Aquila chrysaetos</i>	Golden Eagle			A		X
<i>Athene cunicularia hypugaea</i>	Western Burrowing Owl	SC	S	PR		X
<i>Calcarius ornatus</i>	Chestnut-collared Longspur					
<i>Meleagris gallopavo mexicana</i>	Gould's Turkey					X
<i>Melospiza lincolnii</i>	Lincoln's Sparrow					X
<i>Passerculus sandwichensis</i>	Savannah Sparrow					X
<i>Picoides arizonae</i>	Arizona Woodpecker					X
<i>Sialia sialis fulva</i>	Azure Bluebird					X
FISH						
<i>Agosia chrysogaster chrysogaster</i>	Gila Longfin Dace	SC	S	A		X
<i>Catostomus clarkii</i>	Desert Sucker	SC	S			X
<i>Catostomus insignis</i>	Sonora Sucker	SC	S	P		X
<i>Gila intermedia</i>	Gila Chub	LE		P	WSC	X
<i>Poeciliopsis occidentalis occidentalis</i>	Gila Topminnow	LE		A	WSC	X
<i>Rhinichthys osculus</i>	Speckled Dace	SC		E		
INVERTEBRATES						
<i>Argia sabino</i>	Sabino Canyon Dancer	SC	S			
<i>Pyrgulopsis thompsoni</i>	Huachuca Springsnail	C	S			X
MAMMALS						
<i>Antilocapra americana americana</i>	American Pronghorn					X
<i>Baiomys taylori</i>	Northern Pygmy Mouse		S			

<i>Choeronycteris mexicana</i>	Mexican Long-tongued Bat	SC	S	A	WSC	
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend's Big-eared Bat	SC	S			X
<i>Dipodomys spectabilis</i>	Banner-tailed Kangaroo Rat					X
<i>Lasiurus blossevillii</i>	Western Red Bat		S		WSC	X
<i>Leptonycteris curasoae yerbabuenae</i>	Lesser Long-nosed Bat	LE		A	WSC	X
<i>Myotis yumanensis</i>	Yuma Myotis					X
<i>Notiosorex cockrumi</i>	Cockrum's Desert Shrew					X
<i>Nyctinomops femorosaccus</i>	Pocketed Free-tailed Bat					X
<i>Reithrodontomys fulvescens</i>	Fulvous Harvest Mouse		S			
<i>Sigmodon ochrognathus</i>	Yellow-nosed Cotton Rat	SC	S			
<i>Tadarida brasiliensis</i>	Mexican Free-tailed Bat					X
PLANTS						
<i>Erigeron arisolius</i>	Arid Throne Fleabane		S			
<i>Heterotheca rutteri</i>	Huachuca Golden Aster	SC	S			
<i>Lilaeopsis schaffneriana</i> ssp. <i>recurva</i>	Huachuca Water-umbel	LE			HS	
<i>Spiranthes delitescens</i>	Canelo Hills Ladies'-tresses	LE			HS	
<i>Tragia laciniata</i>	Sonoran Noseburn		S			
REPTILES						
<i>Aspidoscelis burti stictogrammus</i>	Giant Spotted Whiptail	SC	S			
<i>Gyalopion quadrangulare</i>	Thornscrub Hook-nosed Snake		S	PR		
<i>Heloderma suspectum</i>	Gila Monster					X
<i>Hypsiglena</i> (undet. sp.)	Hooded Nightsnake					X
<i>Kinosternon sonoriense sonoriense</i>	Sonora Mud Turtle					X
<i>Lampropeltis getula nigrita</i>	Western Black Kingsnake			A		X
<i>Masticophis bilineatus</i>	Sonoran Whipsnake					X
<i>Micruroides euryxanthus</i>	Sonoran Coralsnake					X
<i>Sceloporus slevini</i>	Slevin's Bunchgrass Lizard		S			X
<i>Tantilla yaquia</i>	Yaqui Black-headed Snake		S			
<i>Terrapene ornata luteola</i>	Desert Box Turtle			PR		X
<i>Thamnophis eques megalops</i>	Northern Mexican Gartersnake	C	S	A	WSC	X

Status key:

Status: LE = U.S. Endangered Species Act (ESA) – Endangered

LT = U.S. Endangered Species Act - Threatened

C = U.S. Endangered Species Act – Candidate

SC = United States Fish and Wildlife Service – Species of Concern
 S = United States Forest Service – Sensitive
 WSC = Arizona Game and Fish Department – Wildlife of Special Concern
 SGCN = Arizona Game and Fish Department – Species of Greatest Conservation Need
 HS = Arizona Department of Agriculture (Arizona Native Plant Law) – Highly Safeguarded species
 MEX-P = Determined endangered in Mexico
 MEX-A = Determined threatened in Mexico
 MEX-PR = Subject to special protection in Mexico
 MEX-E = Probably extinct in Mexico

Table C2

Species	Status	Need	Coordinating Partners	ASP Action	Zone
<i>Mammals</i>					
Endangered Cats: Jaguar, Ocelot, Jaguarundi	LE (all); WSC /MEX- P/SGCN (Jaguar and Ocelot)	Maintain potential movement corridor options for these species from Mexico to the southwestern United States.	AZGFD, USFWS	Coordinate with the AZGFD and FWS as it investigates sighting reports of ocelot, jaguarundi, and jaguars as they are submitted, and assist with implementation of the Jaguar Conservation Agreement and Strategy, as appropriate.	GLZ; RAZ
Pronghorn	SGCN	2012 Status: only 8 pronghorn found in the valley, 7 female, 1 old, non- breeding male. The AZGFD plan is to introduce a total	AZGFD	Communicate/coordinate with adjacent landowners on possible cooperation/implementation of AZGFDs re-establishment effort.	GLZ

		of 70 – 80 pronghorn into the area including Elgin and San Rafael, so perhaps 35 – 40 in the San Rafael Valley with a target ratio of 1 buck/4 – 5 does			
<i>Reptiles / Amphibians</i>					
Sonora Tiger Salamander	LE; WSC; SGCN	Maintain habitat and presence of the species on the SRSNA.	AZGFD conducts 4 monitoring trips per year (1 each usually during January-February, March, April, May-June) for Monitoring trips generally consist of seining a sample of 20 known localities per trip. 2013 dates of salamander surveys along with the AZGFD lead: First survey – Feb 11-14 with Jeff Sorensen (623-236-7740) as lead Second survey – Mar 4-7 with Jeff Sorensen as lead Third survey – Mar 18-21 with Tom Jones (623-236-7735) as lead		RAZ (GLZ; at earthen tanks)
Northern Mexican Gartersnake	C; S; WSC; SGCN; MEX-P	Maintain habitat and presence of the species on the SRSNA; ongoing monitoring and bullfrog control.	AZGFD, Tucson Region (Sharon Lashway), AZGFD Nongame Branch (Tom Jones)	Coordinate with AZGFD on monitoring and management of aquatic herpetofauna	RAZ

Ornate box turtle	SGCN; MEX-PR	Maintain habitat and presence of the species on the SRSNA.	The AZGFD is gathering baseline locality/distribution information for box turtles. Document localities where box turtles are observed (box turtle activity is greatest during monsoon, July-August) and provide the information to the AZGFD.		GLZ
<i>Birds</i>					
Arizona Grasshopper Sparrow	S; SGCN	Maintain habitat and presence of the species on the SRSNA.	AZGFD		GLZ
Birds	Various	Maintain habitat and presence of the species on the SRSNA.	Tucson Audubon Society	Coordinate with Tucson Audubon Society on IBA bird surveys and monitoring. 2013 survey date: 02/08/2013	GLZ; RAZ
<i>Fish</i>					
Gila topminnow	LE; WSC; SGCN; MEX-A	Currently extirpated from SRSNA; Renovate Sharp Spring, Heron Spring, Santa Cruz River and re-stock	AZGFD, USFWS	Coordinate with USFWS (Doug Duncan) and AZGFD Native Fish Program (Ross Timmons)	RAZ
<i>Aquatic Plants....</i>					
Huachuca water-umbel	LE; HS				

Notes: Management Zones: GLZ (grassland zone), RAZ (riparian aquatic zone), CRZ (cultural resource zone).

Status: LE = U.S. Endangered Species Act – Endangered

C = U.S. Endangered Species Act – Candidate

S = United States Forest Service – Sensitive

WSC = Arizona Game and Fish Department – Wildlife of Special Concern

SGCN = Arizona Game and Fish Department – Species of Greatest Conservation Need

HS = Arizona Department of Agriculture (Arizona Native Plant Law) – Highly Safeguarded species

MEX-P = Determined endangered in Mexico

MEX-A = Determined threatened in Mexico

MEX-PR = Subject to special protection in Mexico

Appendix D Detailed Information about Cultural Resources for SRSNA

Prehistoric (Pre-Contact) Cultural Resources

The San Rafael Valley is characterized by unique biological and geographic features that contributed to its use as a migration route between southeast Arizona and northeast Sonora during prehistory. A plethora of archaeological sites and isolated archaeological features and artifacts through this corridor indicate that it served as a contiguous area for the movement of people across the region (MacWilliams 2001:1). Archaeological surveys indicate that numerous sites are situated along the Santa Cruz River (Danson 1946; MacWilliams 2001). The fine-grained igneous cobbles present in the bajada gravels of the Santa Cruz River were used by prehistoric people to make a variety of chipped stone tools and grinding implements. Prehistoric groups may have revisited several sites over the course of thousands of years. The combination of patinated chipped rocks, which are associated with early human use of the region with ceramics, which were introduced later, suggest long-term land use in particular areas (MacWilliams 2001:131).

Relatively few systematic surveys have documented prehistoric land use in the area. Based on current data, prehistoric cultural materials in the region appear to represent a contact zone between Hohokam and Trincheras cultures, which are referred to as the “Santa Cruz contact zone” by Ruble (1999). Buried deposits dating to various time periods may be present in the study area. Documented prehistoric and historic sites in the San Rafael Valley are characterized by excellent site integrity and preservation (MacWilliams 2001:131-133).

Paleoindian (11,500? – 7500 B.C.)

The paleoindian period represents the earliest archaeological evidence for human occupations of North America. Paleoindian groups were characterized by small, mobile communities of hunter-gatherers. The movement of these groups was likely closely tied to the seasonal availability of plant and animal resources in particular areas. Paleoindian kill sites of large animals such as mammoth and bison have been identified in southern Arizona. Paleoindian sites are primarily identified on the basis of stone tool technologies such as Clovis and Folsom.

Although paleoindian materials have not yet been identified on the San Rafael Natural Area, paleoindian occupation of the region is likely. An isolated Clovis point was recovered southeast of the Greene Ranch at AZ EE:10:38(ASM). In addition, the high density of paleoindian archaeological remains 50 kilometers away in the San Pedro Valley river corridor suggests that the San Rafael Natural Area would have also experienced paleoindian occupations (MacWilliams 2001:7).

Archaic (7500 – 2100 BC)

The Archaic Period in southern Arizona and the American Southwest is generally characterized by increased evidence for sedentism. In addition, Archaic diets appeared to rely more on processed plant materials than the preceding Paleoindian period and the introduction of agricultural techniques into hunting and gathering subsistence methods. As part of this lifeways transition, habitation structures become more substantial and permanent, storage areas become more pronounced, and fragile and bulky containers such as ceramics are first produced. Archaic period occupation has been documented in the San Rafael Valley. In particular, Middle (6500 – 3500 BC) and Late (3500 – 2100 BC) Archaic sites have been identified. MacWilliams (2001) identified several lithic scatters that could date to the Archaic and Early Agricultural periods. Two of the 17 lithic scatters that he identified in his San Rafael de la Zanja Land Grant River Corridor Survey had hearths.

Ceramic Period (A.D. 1 – A.D. 1450)

Around AD 1, people began to establish permanent or semi-permanent settlements, rely more heavily on cultigens, and to produce pottery. The timing of agriculture and the production and use of ceramic vessels varies, but with a trend towards the increasing use of intensive subsistence techniques, increased sedentism, and an increased use of pottery forms in domestic activities.

The Santa Cruz River provided rich soils and marshy areas that allowed for the early cultivation of crops within the river corridor. Unlike the adjacent Santa Cruz and San Pedro River Valleys, the San Rafael Valley's higher elevation made it more prone to freezing temperatures that would have reduced agricultural production. The Early Agricultural Period (2100 BC – AD 1) was marked by evidence for cultivation and by the appearance of stone tools associated with processing vegetal matter such as grinding implements. Some of the earliest agricultural communities were established in the vicinity of Tucson and these types of villages could have also been represented in the San Rafael area. The villages dating to this period near Tucson were characterized by semi-subterranean circular pithouses. These structures were built using branches, thatch and mud. Storage pits within and outside of the structures suggest that people were storing food and other materials. Irrigation features such as ditches and canals were used to channel runoff from bajadas and waterways into fields. The use-life of individual structures is difficult to determine. The village sites, however, appear to have had relatively long-term seasonal or year-round occupations.

Ceramic production began in southern Arizona at the end of the Early Agricultural period (ca. AD 1) and marked the transition to the Early Ceramic period (AD 50 – 500). At this time, cultigens such as beans, corn, and squash became more important to local diets and supplemented wild plants and animals. In the San Rafael River Valley, MacWilliams (2001) identified eleven sites that appear to date to the first introduction of pottery in the region (ca. AD 150). He also identified several sites in the San Rafael River Valley that date to various stages

during the ceramic period (ca. AD 150 – 1500), but did not have sufficient diagnostics to attribute to a specific temporal phase.

Around AD 300 material markers of an archaeological culture called the Hohokam were identified in southern Arizona. Large Hohokam villages were constructed along rivers and other waterways. The Hohokam cultural sequence is roughly divided into the preClassic (AD 650 – 1100) and the Classic (AD 100 – 1450) periods. During the preClassic period, Hohokam settlements were typically composed of pithouses arranged into courtyard groups with associated cemeteries, activity, and food processing areas. Burial practices primarily consisted of cremations. Public architecture consisted of a network of ballcourts at Hohokam settlements across southern, central, and portions of north-central Arizona. These ballcourts are roughly derivative of Mesoamerican ballcourts and were likely the locus of communal gatherings to attend ball games, ceremonies, and associated markets. Along the Santa Cruz River, preClassic villages were first characterized by small hamlets of assembled pithouses. Through time, these villages became dispersed over a larger area and populations increased.

The Hohokam Classic period in southern Arizona and elsewhere was marked by a series of changes to cultural, demographic, and settlement patterns of Hohokam life. Habitation structures shifted from pithouses to above ground adobe structures arranged in compounds. Ballcourts were largely abandoned and platform mounds became the primary form of public architecture (ca. AD 1275-1300). Platform mounds were distributed across the Hohokam culture region and may have served various functions. Rooms were built atop some platform mounds in the later portions of the Hohokam Classic period. A few burials have also been identified at the top of platform mounds. Classic period Hohokam settlements were primarily concentrated along major rivers and were not as dispersed as previous preClassic period settlement arrangements. MacWilliams identified one Classic period Hohokam site in his survey of the San Rafael River Valley (AZ EE:10:81[ASM]) based on the presence of Santa Cruz Polychrome sherds (AD 1100 – 1500).

Trincheras

Concurrent with the Hohokam culture, the Trincheras archaeological culture was situated in northern Sonora and southern Arizona. Due to a comparative dearth of archaeological data on the Trincheras sites, less is understood about Trincheras characteristics than contemporaneous Hohokam cultural developments. Trincheras settlements are typically associated with the presence of polished purple-on-red pottery. The Trincheras IV period (ca. AD 1300 – 1450) marked the construction of hillside settlements that appeared to have defensive positioning and features. Walled terraces were used as agricultural fields as well as for habitation structures.

The San Rafael Valley is situated in a contact zone between the traditional Hohokam culture region and areas where Trincheras influences are seen in greater abundance. Sites in this area may represent a mixture of Hohokam and Trincheras traditions. These traditions wane in the

archaeological record around AD 1450 when large villages were abandoned and populations in southern Arizona became more dispersed on the landscape.

Protohistoric Period (DATES)

Archaeological surveys of the San Rafael River Valley and adjacent regions suggest that late prehistoric and protohistoric resource extraction and occupation of the area was likely (MacWilliams 2001; Hadley and Sheridan 1995). Pima and Sobaipuri groups were present in the area when the 1821 San Rafael de la Zanja Land Grant was designated. Although archival resources and oral history of local indigenous populations provides some information of the extended use of these areas by Native American populations, future work should include consultation with these groups on the presence of Traditional Cultural Places (Hadley and Sheridan 1995:6). Ten sites in MacWilliams' survey (2001) have both prehistoric and historic components, which indicate that certain locations on the landscape were periodically used across a long time span.

Appendix E
List of relevant reports and references for SRSNA

DOCUMENT TYPE	DATE	AUTHOR	TITLE
A Profile of Arizona's San Rafael Valley	1994	San Rafael Valley Association and the Sonoran Institute	A Profile of Arizona's San Rafael Valley
Baseline Conditions Report	2000	ASP	San Rafael Ranch Conservation Easement Baseline Conditions Report
Conservation Easement Monitoring Plan	2003	ASP	San Rafael de la Zanja Conservation Easement Monitoring Plan
Deed of Conservation Easement	1999		San Rafael Short Grass Prairie Preserve Deed of Conservation Easement
Guiding Framework	1994	San Rafael Valley Association and the Sonoran Institute	A Framework for Guiding the Future of Arizona's San Rafael Valley
Monitoring Report	2005	AZGFD	Final Draft. Grassland Habitat Monitoring on the San Rafael Ranch State Park and the San Rafael de la Zanja Land Grant Easement
Monitoring Report	2006	AZGFD	Grassland and Riparian Habitat Monitoring on the San Rafael State Natural Area, Santa Cruz County, Arizona
Monitoring Report	2007	AZGFD	Grassland and Riparian Habitat Monitoring on the San Rafael State Natural Area, Santa Cruz County, Arizona
Monitoring Report	2008	AZGFD	Grassland and Riparian Habitat, Huachuca Water Umbel, and Post-fire Vegetation Monitoring on the San Rafael State Natural Area, Santa Cruz County, Arizona
Monitoring Report	2009	AZGFD	Post-Fire Vegetation Monitoring, Invasive Species Mapping, and Sensitive Species Inventory and Monitoring on the San Rafael State Natural Area, Santa Cruz County, Arizona
University Technical Report	Multiple years of data collection	UofA	Vascular Floras of Sonoita Creek State Natural Area and San Rafael State Park: Arizona's First Natural-Area Parks

DOCUMENT TYPE	DATE	AUTHOR	TITLE
Sale Agreement	1999		Agreement for the Purchase and Sale of Real Estate
Folder of Info on Grazing in ASP Files	2002	ASP	Memo recommending against using grazing as a management tool for Fire Mitigation Measures
Folder of Info on Grazing in ASP Files	2002	ASP	Memo proposing lease permitting grazing on SRSNA as a management tool.
Rangeland Monitoring	2007	George Ruyle, et al. Rangeland Ecology and Management, UofA	Rangeland Monitoring on the San Rafael de la Zanja Conservation Easement

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Bultman, M.W., 1999, Geometry, structure and concealed lithology of the San Rafael basin, southeastern Arizona: USGS Open File Report 99-399 (Appendix F?)

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