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4.01 SPECIAL MANAGEMENT

Stewardship Plan

SNWA committed to join with stakeholders to develop a long-term plan for the property. The purpose of this document is to establish long-term management direction for the Warm Springs Natural Area. It is SNWA's intention that the Stewardship Plan will establish a framework for appropriate land uses for the property that preserve the integrity of natural resources and lay a foundation for the property that will foster stakeholder relationships. The Stewardship Plan is intended to clarify SNWA's responsibilities and management direction as they pertain to conservation on the Warm Springs Natural Area and ensure consistency with the SNWA's commitments in the SNPLMA Nomination and the Muddy River Recovery Implementation Program.

While the Stewardship Plan is intended to provide guidance for SNWA management and future land uses and activities on the Warm Springs Natural Area, it is important to note that the Stewardship Plan is a conceptual document to begin dialogue and is not intended to require implementation of any specific management action recommendations. Implementation of such actions is left to the discretion of the SNWA Board of Directors through the annual budgeting process and through specific contract approvals as needed.

Management Priorities

The prioritization process was formulated by the Core Team and experts in various fields. The Mission Statement developed by the Core Team establishes management priorities and serves to frame future decisions.

The following are management priorities for the property:

- Manage the property for the benefit and recovery of the Moapa dace. This includes restoring and protecting the thermal springs and their outflows.
- Manage the property for the benefit of federally-protected, state-protected, sensitive, and thermal endemic species.
- Manage the property as a Natural Area – which means encouraging native species and their ecological assemblages and removing invasive species.
- Reduce fuel loads and establish fire breaks on the Natural Area to protect neighbors and property.
- Carry out SNPLMA commitments for the property for controlled public access of the Natural Area.

Goals and Objectives

Goals and objectives guide implementation of future management actions toward activities that produce the desired outcome of a well-balanced Natural Area. The Core Team identified the following goals and objectives to direct future management for the Warm Springs Natural Area:

- Protect listed, sensitive, and thermal endemic species and their habitat when conducting management activities;
- Reduce fuels on site, focusing first on the portion of the property adjacent to neighbors and then property-wide fuels reduction to insure safety;
- Preserve cultural and historic resources on the property;
- Utilize local, native species when restoring the Natural Area;
- Reduce invasive species on site, where possible;
- Encourage public appreciation of the natural systems through education;
- Provide the opportunity for scientific research programs of the Warm Springs ecological system; and
- Consider the Warm Springs Natural Area as a component of the Muddy River ecosystem (migratory flyway, headwaters of the Muddy River, etc.) when implementing management decisions.

MANAGEMENT PRIORITIES

Manage the property for the benefit and recovery of the **Moapa dace**. This includes restoring and protecting the thermal springs and their outflows.

Manage the property for the benefit of **protected species**: federal, state, sensitive and thermal endemic species.

Manage the property as a **Natural Area** – which means promoting native species and their habitats and controlling invasive species.

Reduce fuel loads and establish fire breaks on the Natural Area to protect neighbors and property.

Carry out SNPLMA commitments for controlled **public access** of the Natural Area.

Illegal Dumping

Illegal dumping of trash has occurred at certain locations of the WSNA for many years. Lawn and garden refuse and household items are a few of the commonly encountered items once disposed of on the property. The most serious known dump site is an area adjacent to BLM land that has always been accessible just off Highway 168 on a gravel road. To prevent further dumping, it is necessary to adequately fence off open access areas and to properly sign the property. Existing trash will need to be removed and disposed of properly at an authorized landfill.



Beaver Management

Although beaver dams and ponds are well known for their important role in flood control and in the establishment of wetlands, meadows, and riverine forests, beaver dams and ponds can be detrimental to Moapa dace habitat. Dams cause the swift-flowing water to slow, pond, and cool, which reduces the length of stream with the warm water temperatures needed by the dace. This ultimately reduces the amount of adequate dace habitat. Non-native dace competitors and predators such as mollies and tilapia thrive in the slow moving water behind beaver dams. Due to the imperiled status of the Moapa dace, beavers and their dams should be removed from streams containing Moapa dace. Beaver and dam removal will improve habitat for the dace by increasing water temperatures, increasing appropriate swift water habitat, and will reduce habitat for non-native fish.



Grazing

The current ecological condition of WSNA (ranging from poor to good) is primarily due to the cumulative effect of crop cultivation and extensive grazing. While grazing pastured or grassland systems can have the visual effect of a pleasing pastoral scene, its persistent practice has more subtle but lasting negative effects on natural systems. Cattle preferentially forage on certain species, thereby encouraging the expansion of less preferred plants. On WSNA, alkali goldenbush (*Isocoma acradenia*) and honey mesquite (*Prosopis glandulosa*) have greatly increased due to grazing.

Grazing for the sake of livestock production is no longer a justifiable activity under managing the property as a natural area. The use of animals to accomplish certain management objectives may be considered in the event that other alternatives are not available or are less satisfactory.



Using grazing for the purpose of fuels reduction or biological weed control is worthy of consideration given other factors of habitat quality are preserved. Currently, preference for fuels reduction is being given to mechanical mowing and prescribed fire. For the purpose of weed control in biologically sensitive areas where chemical control is not appropriate, confined, intensive grazing may produce desirable outcomes.

Vegetation manipulation by grazing should only be considered in localized situations. Grazing can have the unwanted outcome of introducing or spreading noxious weeds. Overgrazing can negatively affect plant community composition. Serious problems persist from past grazing, impacting stream bank stability, water quality, and hydrological function, which has negatively altered Moapa dace habitat.



4.02 FIRE MANAGEMENT

Fire History

Warm Springs Natural Area has experienced many wildfires over the past half century. Large wildfires have occurred approximately every ten years. A large wildfire occurred in 1987 consuming several homes and barns at the old Home Ranch. Another catastrophic fire occurred in 1994 impacting property and Moapa dace habitat on the Moapa Valley National Wildlife Refuge. In 2004, a wildfire followed the palms up the North Fork and destroyed a home. In 2008 a lightning strike ignited a palm tree on the northern side of the property starting a 2.5 acre wildfire that was quickly quelled thanks to water trucks working nearby. A fire in 2010 burned 601 acres, destroying a residence, staffing quarters and the "Big House" on the LDS Church Recreational Area.

Fire can have positive effects on natural ecosystems. Many ecosystems require fire to maintain plant community health and productivity which can support a more abundant and diverse wildlife component. While wildfire can be beneficial, the threat of wildfire to private property has been and continues to be a relevant concern for property owners in the Warm Springs area. The impact of wildfire to the endangered Moapa dace is also of concern. Burning vegetation along streams can raise the water temperature. Ash deposition in streams can raise the pH and lower the dissolved oxygen.

The loss of desirable riparian and mesquite woodland due to wildfire can also have significant impacts on sensitive bird species. Wildfire results in the expansion of introduced weeds which in turn can increase frequency and extent of future wildfires. Much of WSNA is densely vegetated and entails a certain degree of risk for wildfire. Steps to reduce wildfire risk to property and habitat will be implemented as part of a fuels reduction program and outlined in a wildfire management plan.



Pre-suppression

Pre-suppression means taking preventative action to reduce the likelihood or extent of accidental or natural wildfires. Pre-suppression activities include surveying WSNA and prioritizing areas that would benefit from fuel reduction, fire breaks, and vegetative manipulation. Weed management is a related activity that contributes to the reduction of fine fuels. A survey of fuels around priority wildlife areas, structures, and neighboring properties will be required on a regular basis. Fuel loads may be reduced using a variety of methods including mechanical, chemical, and biological treatments. Because fuel biomass will continually accrue from one growing season to the next, fuels reduction will need to be an ongoing program requiring vigilant monitoring.

Palm trees contribute to the most serious build up of fuels at the WSNA. Dry palm fronds are highly flammable and are easily ignited by lightning strikes. Because so much biomass accumulates in the palm tree skirts, palm fires are intense and can carry in the tree canopies regardless of understory vegetation. Fire risk from palm trees can be partially remedied by regularly trimming palm skirts or complete removal of enough trees to disrupt fuel continuity. Given the thousands of palm trees on the property, palm frond trimming is not feasible for property wide application.

Grass contributes to the establishment of a fine fuel load through which fire can rapidly advance. There are several areas where perennial grasslands are extensive. Because these grasses are generally valuable habitat components, maintaining roads to function as fire breaks should be employed. Additional roads can be created to act as fire breaks against grassland fire. Periodic prescribed burns in grasslands can help minimize the buildup of fine fuels. Prescribed burning can also improve the overall quality of grass dominated systems.

Prescribed fire

Prescribed fire can be a valuable management tool and is a viable option for WSNA. Use of prescribed fire is however contingent upon the development of a site specific prescribed fire plan with a full complement of appropriate response personnel and equipment. Following prescribed burns, areas that lack the capacity to rejuvenate as native plant communities should be reseeded with native species. Encouraging native plant revegetation will help exclude the establishment of exotic weeds which can exacerbate future fire problems.

Fire Breaks

Fire breaks can provide an effective safeguard against fire advance if their width is sufficient to prevent a breach. The appropriate width of a fire break is dependant upon adjacent fuel types. Higher, denser vegetation such as trees require wider fire breaks. Regardless of fire break design, high winds can carry embers far beyond any fire break. Fire breaks require regular maintenance to preserve their effectiveness. Fire break lines will need to be monitored regularly and treated as appropriate. Mechanical or chemical treatments can be effective though mechanical treatments can subsequently promote the growth of weedy species.

Besides defensive perimeters around neighboring property owners, fire breaks within the property are necessary to reduce the spread and severity of fire. Palm trees skirts form a near continuous fuel source for fire to travel riparian corridors. The heat generated from flame engulfed palm trees contributes to the rapid spread of fire into neighboring vegetation. Sections of palm trees along the waterways may be removed to eliminate a contiguous line of fuel load.

Palm Management

Fond memories of swimming amid the palms as a child at Warm Springs pervade the memory of many local citizens. The public has a strong emotional link to the past and palm trees appeal to people's sense of place. There is considerable debate regarding the palm trees' origin and the role California palms play in the riparian ecosystem. Palms on WSNA will be managed individually, depending upon an identified impact to hydrological function, stream ecology, or as a fire risk. Palms having no direct impact may be left for wildlife. The first management solution for palms considered as a fire risk may be to trim the palm skirt, otherwise they may be removed.



Fire Response

The Clark County Fire Department has fire suppression responsibilities outside incorporated areas within Clark County and therefore has command responsibility. The closest Clark County Fire Department station is the Moapa Volunteer Fire Department Station 72 located in Moapa. Federal agencies responded to the fire in July 2010, due to the proximity of WSNA to the Moapa Valley National Wildlife Refuge.



Post-fire Rehabilitation

Depending upon the severity and extent of habitat damage following a wildfire, natural recovery, augmented recovery, or intensive rehabilitation should be evaluated for treatment consideration. Post-fire weed control is usually necessary to prevent the spread of invasives. Post-fire monitoring using photo-points and vegetation analysis should be encouraged. Unlike federal agencies which have access to emergency fire funds to help rehabilitation efforts, WSNA rehabilitation will be contingent upon budgeted funding availability. For that reason, pre-suppression will be emphasized; however, a post-fire analysis can be conducted to develop a response plan that will document restoration needs and costs. Post-fire rehabilitation plans will be coordinated with the Biological Advisory Committee and the USFWS.



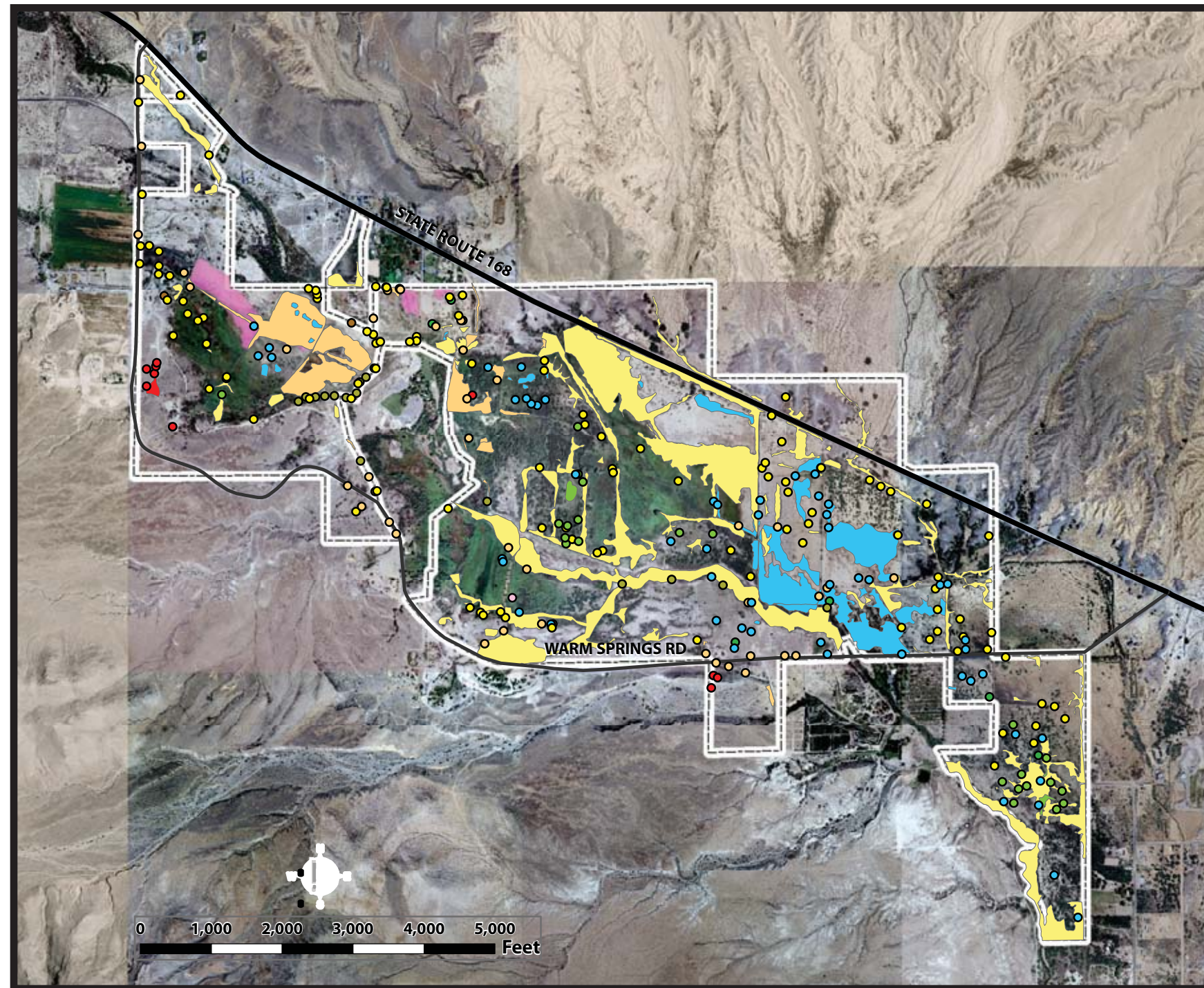
4.03 INVASIVE MANAGEMENT

2008 Weed Survey

- Malta Starthistle
- Perennial Pepperweed
- Russian Knapweed
- Sahara Mustard
- Saltcedar
- Morning Glory

- Hoary Cress
- Malta Starthistle
- Perennial Pepperweed
- Russian Knapweed
- Sahara Mustard
- Saltcedar
- Common Reed
- Giant Reed
- Morning Glory

- Warm Springs Natural Area



A 2008 weed survey at the WSNA identified seven noxious and two nuisance weed species (Tri-County Weed Control 2008). Three additional noxious weeds and five additional nuisance weeds were identified by WSNA staff. Prioritization of weed species, based on negative habitat effects, invasiveness, and risk for additional impacts at the WSNA, identified both noxious and nuisance weed species as targets for control.

Weed Management

Any undesired plant in a given location can be classified as a weed; however, not all weeds are equal. Some weeds are labeled “noxious” and require abatement action according to Nevada State law. In Nevada, noxious weeds are broken into one of three categories (A, B, or C). Category A noxious weeds require active control of all populations. Control of Category B noxious weeds is centered on reducing the risk of further contamination and the eradication of emerging populations. Category C noxious weeds are generally widespread, and abatement is at the discretion of the state quarantine officer. Other weeds are considered “nuisance” and have no legal requirement for eradication/control even if the nuisance weed may be ecologically more damaging than any given noxious weed.

Invasive Plants

While saltcedar is one of the most dominant weeds on the property, it is relatively stable when compared to Russian knapweed which is expanding and has the potential to dominate new areas on the WSNA. Similarly, Malta starthistle is highly invasive due to its mode of dispersal. It is commonly found along roads and trails where it is dispersed as a hitchhiker on people, animals, or vehicles. Russian thistle is problematic due to its potential risk for wildfire. Russian thistle can grow in dense stands and is extremely flammable when dry. Wind commonly piles Russian thistle along fence lines or hedgerows, creating an opportunity for rapid fire movement over long distances. Russian thistle can also roll across the landscape while on fire during windy conditions, further exacerbating fire spread.

Bermudagrass was originally planted as a pasture grass and dominates much of the grassland and mesquite understory. Due to its competitive nature, it precludes many desirable native species especially herbaceous forbs which are distinctly lacking on the property. Eelgrass, an aquatic plant, is of particular importance to Moapa dace habitat, though it is already widespread and has likely reached its maximum distribution on the WSNA. The remaining species occupy small areas and/or comprise a minimal threat but will either be monitored or treated as time and resources permit.

The WSNA management strategy follows an Integrated Pest Management (IPM) approach to weed control and/or eradication. Mechanical, chemical, and biological control measures will be given due consideration as control treatments. Because of the contamination potential for chemical

residues into surface waters supporting Moapa dace and other sensitive aquatic species, non-chemical control options will be given priority in areas where contamination is possible. Chemicals that can directly or indirectly affect fish will not be used within a generous buffer zone, in windy conditions, or during inclement weather. The use of any chemical within or bordering dace habitat will require coordination with the US Fish and Wildlife Service. In all instances, best management practices will apply. Use of any restricted chemical will require an on-site, licensed person for the duration of chemical application. Care will be taken to prevent the bioaccumulation of systemic chemicals in soils or systems caused by multiple applications or by using highly persistent chemicals. The development of an IPM Plan for the property would address the various issues associated with managing pest species at the WSNA.

Noxious Weeds	Acres Infested	Category	Management Priority
Russian knapweed (<i>Acroptilon repens</i>)	157.5	B	1
Malta starthistle (<i>Centaurea melitensis</i>)	47.9	A	2
Saltcedar (<i>Tamarisk spp.</i>)	35.4	C	3
Perennial pepperweed (<i>Lepidium latifolium</i>)	*	C	8
Sahara mustard (<i>Brassica tournefortii</i>)	1.5	B	9
Hoary cress (<i>Cardaria draba</i>)	*	C	10
Giant reed (<i>Arundo donax</i>)	*	A	12
White horse-nettle (<i>Solanum elaeagnifolium</i>)	*	B	**
Johnson grass (<i>Sorghum halepense</i>)	*	C	**
Puncture vine (<i>Tribulus terrestris</i>)	*	C	**

* Less than one acre

** Low management priority

Nuisance Weeds	Acres Infested	Management Priority
Prickly Russian thistle (<i>Salsola tragus</i>)	150.0	4
American eelgrass (<i>Vallisneria americana</i>)	*	5
Bermudagrass (<i>Cynodon dactylon</i>)	150.0+	6
Red brome (<i>Bromus rubens</i>)	*	7
Field bindweed (<i>Convolvulus arvensis</i>)	*	11
Common reed (<i>Phragmites australis</i>)	*	**
Russian olive (<i>Elaeagnus angustifolia</i>)	*	**



Malta starthistle



Tamarisk



Tamarisk

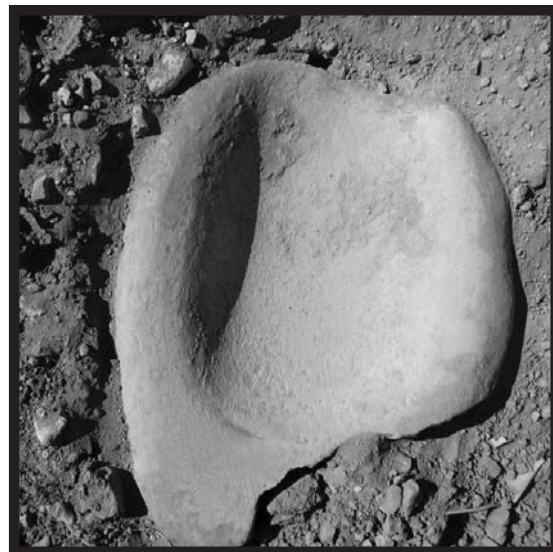
4.04 CULTURAL RESOURCE MANAGEMENT

Many of the important resources found on the WSNA property are cultural and historical. Historic property can include buildings, structures, objects, sites, and traditional cultural properties that are at least 50 years old. Protecting cultural resources on the WSNA is a management goal of SNWA. In 2008, an intensive archaeological survey was conducted to identify and document the archaeological resources on WSNA and evaluate the eligibility of these resources for nomination to the National Register of Historic Places (NRHP) (HRA 2008 and 2009). The survey identified three previously recorded sites and 16 previously unrecorded archaeological sites. Of these 19 sites, 16 are prehistoric habitations, trails, artifacts scatters, and rock shelters; and three are historic. The historic sites include the Home Ranch, irrigation ditches, and a recreational facility built by Xavier Cougat for Folies Bergère showgirls in the late 1950s.

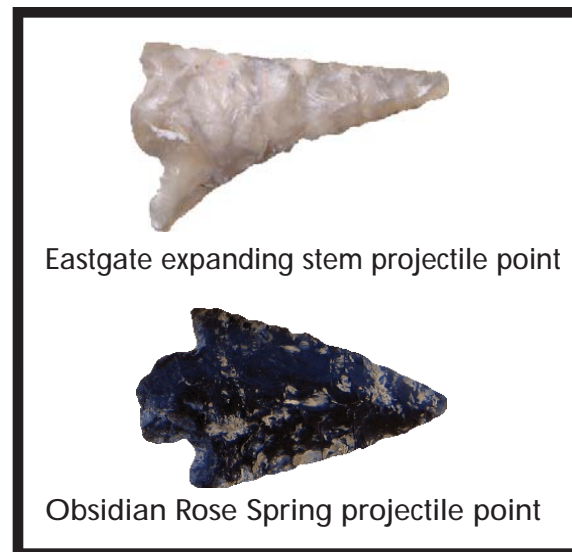
HRA recommended that 12 of the 19 properties are eligible for nomination to the NRHP because they are likely to yield information important to prehistory or history. Most of the NRHP-eligible sites are prehistoric artifact scatters located on the upland terraces and hills. Only a few archaeological sites were identified in the low-lying floodplain where past agriculture would have been practiced.

Management of known archaeological sites includes protection from public access and future development plans. Most of the area's archaeological resources are fragile and can be impacted in direct and indirect ways. Direct impacts occur when a site is affected by construction activities such as grading or digging, and indirect impacts are typically damages that are visual or result from visitors or daily operations. Impacts to the archaeological sites can be avoided by taking these resources into consideration during the early stages of planning. Areas containing known cultural resources should be avoided during future development projects. If avoidance is not possible, then a treatment plan to mitigate impacts to cultural resources should be developed in consultation with the State Historic Preservation Office. These treatment plans may include surface mapping, artifact collection and analysis, monitoring, and in some cases excavation.

Interpretive opportunities for public interest and education will be explored. Signs and other interpretive displays explaining the area's unique history may be incorporated into visitor facilities and trails.



Great Basin metate



Eastgate expanding stem projectile point

Obsidian Rose Spring projectile point

T14S, R65E GLO Plat
(Surveyed Sept. 1881)

